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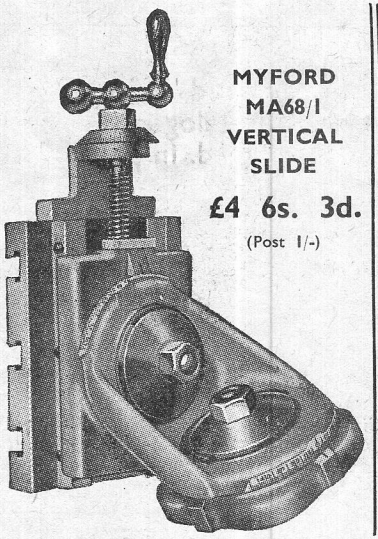

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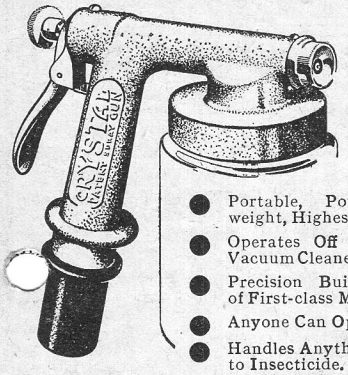

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THE

MODEL ENGINEER

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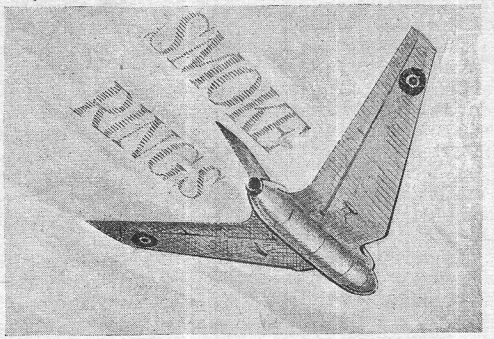
VOL. 95. No. 2377. NOVEMBER 28th, 1946

Slight Expansion



READERS may have noticed that last week, THE MODEL ENGINEER was a little larger, and so it remains this week. An increase in the paper ration has brought this about; a few extra pages are provided for the purpose of giving readers a little more material for their entertainment and, perhaps, their inspiration and instruction. What may be more important at the present time, however, is that several thousand more copies of THE MODEL ENGINEER can be printed per week—not, unfortunately, enough to meet *all* the present demands for it, but sufficient to ease the distribution difficulty which has been such a problem in recent years. If any reader is still unable to obtain a copy, he should write in to the Sales Manager, Percival Marshall and Co. Ltd., 23, Great Queen Street, London, W.C.2, who will be pleased to see if anything can be done in the matter.

Models for Shrewsbury

THE Society at Shrewsbury, which is making very satisfactory progress, is planning an exhibition, to be held at the Technical College, on December 12th and 13th. As a new Society they do not expect to do great things with this first effort, but some good local support has been promised, and a very creditable display is assured. They would, however, much appreciate additional exhibits from model engineers in their area, and will welcome any offers from our readers within reach. The Hon. Secretary, Mr. W. S. Howard, at the Technical College, would be glad to hear from friendly helpers.

Soothing the Nerves

IT is a very distressful world in which we live nowadays. We cannot pick up our morning paper without reading about international jealousies and suspicions, about riots and bloodshed, about vetos and the terrors of atom bombs. At home we still have the irritations of rising prices, of queues for our much-restricted rations, of industrial strikes, and of the spectre of "in short supply" with many of the things we should like to buy. No wonder so many of us look and feel worried at times. Is there any antidote to this plague of trouble? Of course there is—an absorbing hobby, and what more restful and pleasing a relief could there be than a workshop, or a model railway, or an afternoon at the pond side with a power boat, or on the track with live steam "doing its stuff" Much as I dislike the easy criticism of model engineers "playing with toys" so often made by thoughtless people, there is something to be said for the word "playing" in its broader interpretation. The hours devoted to any hobby are playtime for the adult follower, in the sense that they give relaxation and recreation from the sterner problems of daily life. If this relaxation makes the enthusiast physically and mentally better able to play his part as a citizen of the world, and a more socially agreeable companion with whom to live, his "playtime" is fully justified. So when the woes of the world weigh heavily upon us let us get out our models or repair to the quiet absorption of our workshop and say "Begone dull care."

Experimental Engineering

WHEN some years ago the Society of Model Engineers added the word "Experimental" to its title it did a wise thing. It emphasised recognition of the member who liked to get off the beaten track and do something new or something better than it had been done before. In its early days model engineering was largely a matter of the reproduction of prototypes in miniature, "live steam" on the passenger track, the speed boat, the petrol motor, and the aeroplane were but dreams of the future and few hobbyists attempted to give them concrete shape. One of the most striking results of real experimental work has been the development of the speed boat, both steam and petrol propelled. It is astonishing to remember the time when five or six miles an hour was considered a good turn of speed for a model power boat. The institution of our annual speed boat competition changed all that. It set model boat builders something to work for, and improved hull design, better engines and bodies, experiments with flash steam, and the introduction of the petrol motor have resulted in performances transcending all expectation. It has not been an easy road to follow, for it has called for countless failures and disappointments by the way. But the true experimentalist has refused to acknowledge defeat and in the end has achieved his glorious triumphs "round the pole." From five to nearly fifty miles an hour is

SHIP MODELS
AT THE EXHIBITION

By

"JASON"

The Champion Steamer Model. This unorthodox shot of Mr. S. P. T. Tilley's fine model, steam powered (compound engine) of a Yarmouth Steam Drifter shows size and realism. Voted as one of the best steamer models seen for years. The dinghy alone was worth a medal

"THANK goodness it's here again!" This remark was made to me by a greatly relieved ship modeller *apropos* this year's Exhibition. I believe I am safe in saying "So say all of us."

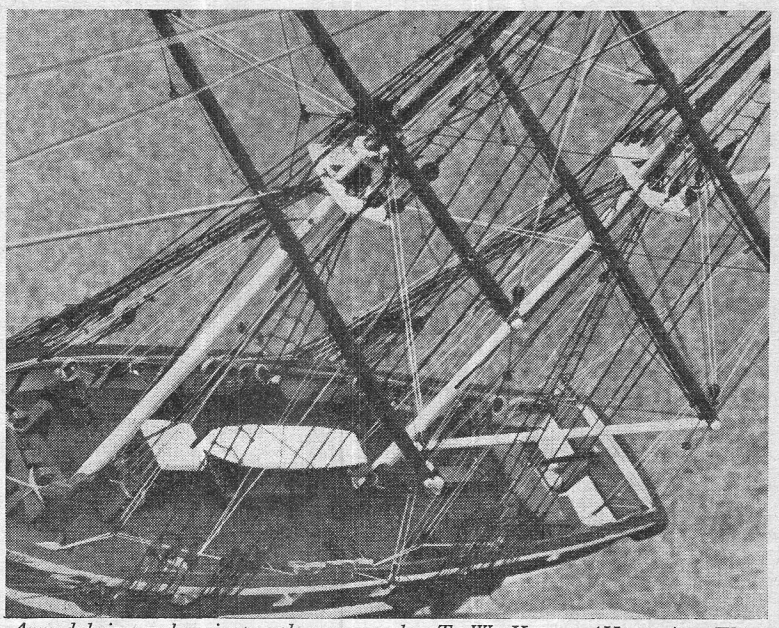
The first impression is that of a high standard in fewer models. This is due probably to the residue of the entries for 1939 having come safely through the blitz, the moves and the general upheaval of a seven-years war. Even a casual glance reveals very little work which can be said to be post-war. The younger men, the modellers of next year, have not yet got into their stride. The times are still unsettling; homes are scarce and the box-room (spare) for modelling is, I imagine, quite a rarity. I spoke to many, however, who have plans for a "corner on the kitchen table." There is an earnest enthusiasm abroad which augurs well for our future craftsmanship. But you want to read about this year's models on show. Well, here goes!

The year 1946 will be memorable for a clash in stylists—the combination of the realists and engineers versus the artists and the woodworkers. For the first time in my many years of writing on models I refuse to take sides. My personal feelings on this occasion must remain in the background. My aim must be, a faithful report of both sides. Naturally my ear was close to the ground and I propose to present a cross-section of modellers' opinion. I can hear some of you muttering, "Come to the point!" That I will. There were two outstanding models, apart from miniatures and "one-foot scenics," which were contestants for the Championship Cup for the best sailing ship model.

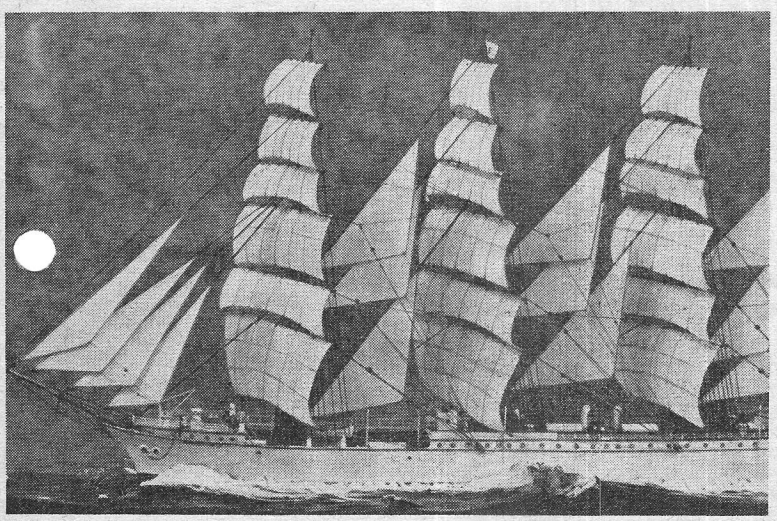
These were Mr. R. F. Bell's five-masted barque *Kobenhavn* and Mr. C. W. Hume's French 42-gun frigate *L'Aigle* (1790). The former was a modern windjammer to a scale of $\frac{1}{8}$ in. to 1 ft., whereas the latter was a comparatively tiny affair in the scale of $\frac{1}{16}$ in. to 1 ft. It was obvious that both men displayed craftsmanship of a very high degree. Both models appeared to be meticulously accurate in scale carried out in detail. Both again had trifling errors. Both erred in choice of colours. Mr. Bell got the Championship Cup, and I have absolutely no quarrel with this decision. He was the undoubted champion in the section. Moreover, I would go further and say that the *Kobenhavn* is one of the finest models of its kind I have ever seen. The maker makes no secret that he had access to every possible plan of the ship and he certainly made very good use of the plans. As an example of the workmanship, I might mention that every box-screw for his rigging is perfectly made in five working parts. Each and every part of the model is hand-made

poster advertising (I think) Capstan brands, of several drifters heading out to sea, you will at once have in your mind's eye a picture of Mr. Tilley's fine work.

The third cup in the Marine Section was won by Mr. A. E. Squire (Teddington) with his free-lance steam driven *B Type Motor Launch*. This was the winner of the "Spectator" Cup specially awarded for powered models showing good work in performance and workmanship, and more especially in design. Mr. Squire established a firm claim on this cup by his clean lines and an efficient layout. He, like all other "power" men, met many obstacles and troubles "on the pond." With a pipe, paper and pencil he worked out solutions and cures. She was 5 ft. 6 in. long, with a speed-boat bottom. Hull 0.025 in. thickness of tinplate. Propeller is two-bladed 3½ in. diameter. Rudders (twin) worked by worm and segment gearing. Power from twin-cylinder single-acting uniflow steam engine. Cylinders ¾ in. × ¾ in. Oil-fired 36-tube boiler 9 in. × 3½ in diameter, tested to 350 lb. The burner automatically cuts off if the engine stops. Two things remain to be said. The shaft has 3,000 r.p.m., giving 10 knots. That's one. *The other is that Mr. Squire (still young) was condemned to be bedridden for life by an accident, but the making and trying of this model enabled him to walk again.* So far, I have dealt with the cup winners only, and space, of course is limited. However, here's a quick notice of the medallists and, if I can squeeze in some general remarks and helpful criticism, I will do so.

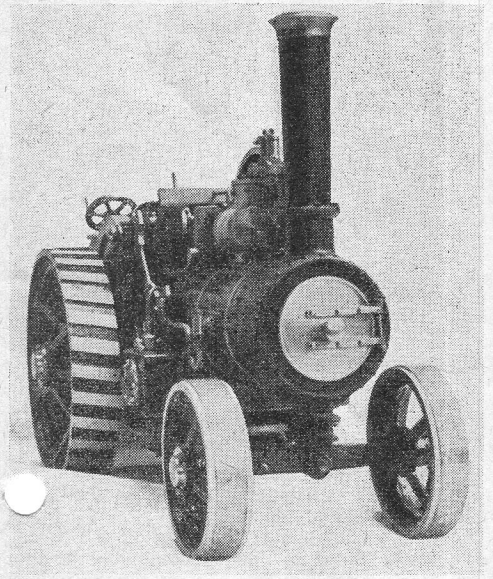


Armed brig, early nineteenth century, by T. W. Karran (Harrow). This view shows the deck arrangements for the merchantmen of those days covering Baltic, North Sea, and Mediterranean



One of several very fine windjammer models, the "Herzogin Cecilie," in the "one-foot-scenic" type. A bow view, showing fo'c'sle arrangements and the sea effects. Modellers should note that the yards on the mast when close-hauled should not *be shown thus, but the main yards are more fore and aft than the upper yards. They are spread like a hand of cards (By D. McNarry)*

I will deal with the stand and cased models. This year's miniatures and one-foot scenics are of a surprisingly high



TRACTION AND PORTABLE

By

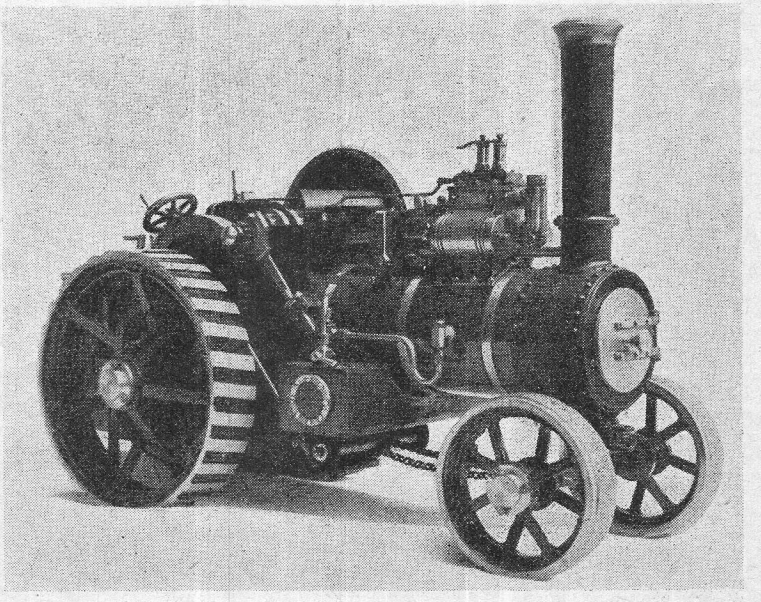
G. HARRISON

THE following short description of two models recently constructed by me may be of some interest to readers of THE MODEL ENGINEER, although I imagine they will say, "What, another traction engine!" But my only real excuse for this one is that the twin high-pressure cylinders fitted to this model have a common valve-chest on top instead of in the more usual side position which, in the case of a two-cylinder job, means that, after fitting two sets of link-motion to drive valves, there is not much space left on the crankshaft for driving-gears—especially if two or more speeds are required. In this model I have arranged two sets of Stephenson link-motion with eccentrics in between the two cranks, resulting in a much more compact layout; also, the cylinder unit has the same appearance on both sides of model.

More Work

The port face is machined at an angle giving a straight-line drive to the valves from the eccentrics, an arrangement which is highly satisfactory, although, of course, it entails a little more work in making. I am not familiar with all the various makes and types of traction engines, but I seem to remember seeing an illustration of an engine with a similar valve-gear years ago in the pages of THE MODEL ENGINEER. Was it in those excellent articles by "Frost Spike," or is my memory at fault? I have no means of ascertaining this, as all my old MODEL ENGINEERS have been disposed of, to my regret.

In all other respects the model follows con-



Mr. G. Harrison's model traction engine

the booster is introduced by means of a " series " jack switch, so that it is connected in series with the local battery ; the voltages of the two batteries are thus added together, provided that the polarity is the same way in each case. Otherwise, of course, the voltages of each will be opposed and subtracted or cancelled out entirely.

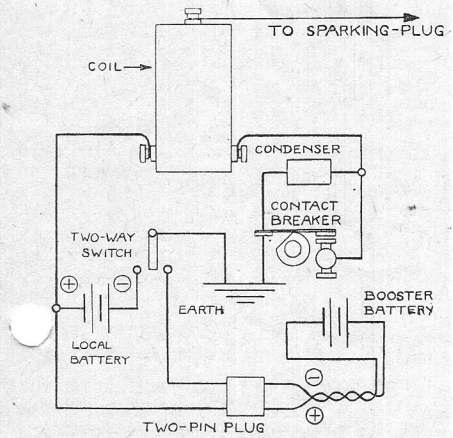


Fig. 1. Booster battery connected in parallel, using two-pin plug and change-over switch

Although this method may produce results, of a sort, I regard the idea of increasing voltage in this way as an entire fallacy, and it is only necessary to employ a little elementary theory (*vide* Ohm's law), plus a modicum of common sense, to understand why. We must necessarily start off with the assumption that the local ignition battery is of the correct *voltage* to work the coil ; if this is not so, it cannot provide satisfactory ignition under any circumstances. But if this condition is fulfilled, the need for a booster battery for starting arises out of the fact that the heavy current requirements under these conditions are beyond the rate at which the battery can supply current without a serious voltage drop. In other words, the demand is for more amperes—not more volts, which are only a means of forcing the *available* amperes through the circuit, against the internal and external resistance.

It is thus evident that the booster battery, in order to produce the most efficient results, should be of the same voltage as the local battery, but of larger current discharge capacity, and connected in parallel with it as in the diagrams shown in Figs. 1 and 2. The fact that circuit No. 3 does in some cases produce the desired effect is beside the point. Increased voltage applied to any circuit will obviously cause more current to flow, but it entails overloading the apparatus in the circuit, and putting abnormal stresses on insulation, which is always undesirable. Ample current supply at the correct voltage is the only way to obtain the maximum efficiency from ignition equipment or any other electrical apparatus.

The idea that increase of voltage in the ignition circuit, is beneficial to starting by producing a " hotter " spark is a very common one, and I have seen users of small engines bringing into action what amount virtually to young power stations, consisting of a string of dry batteries or accumulators connected in series, in the endeavour to start reluctant engines. It is possible that these measures may produce somewhat better ignition efficiency, but they are more likely to burn up contacts and overload coils. The difficulties of the coil designer are bad enough already, without making them any worse. I know of many coils which have been put out of action by overloading, and then passed back to the makers to ask why they have broken down.

Sometimes, however, the high-voltage experts are saved from the consequences of their own folly by the fact that the local battery acts as a resistance or potentiometer, and restricts the amount of current flowing in the circuit. But the intelligent engine user will take more positive and practical steps to ensure that ignition current is used to the best poss ble advantage.

Magneto Boosters

The use of a booster battery connected in series with the primary winding of a magneto, to reinforce the spark normally produced by the latter under starting conditions, is quite practicable, and has been applied in full-sized engines. I believe that at one time fittings for connecting a battery in circuit with a magneto on certain types of engines were available. Mr. R. H. R. Curwen has used a booster in connection with the miniature magneto fitted to his 5-c.c. car.

While admitting that this expedient may be very useful, or even necessary, on magnetos which do not spark efficiently at low speeds, I am not convinced of its general necessity, and consider that it may tend to retrogression in magneto design. The need to use a booster in connection with a magneto destroys one of its most attractive

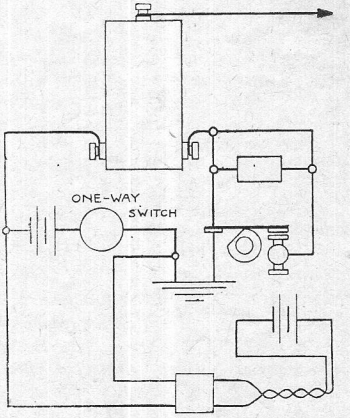


Fig. 2. A simplified method of connecting the booster battery in parallel

features, namely, the complete independence from batteries and extra wiring, which the magneto normally affords. An engine fitted with a magneto is a complete, self-contained and self-sufficing unit, and if this advantage is removed, one may well question whether it is worth while to fit a magneto at all. In actual fact there is no reason why even the smallest magneto should not give

How to Make
A MINIATURE SMUGGLING LUGGER
By Edgar J. March

IN a previous article, I mentioned that the lugger was *par excellence* the craft chos n by the smugglers, and the name will always be associated both with deeds of lawlessness and the heroism of the Deal boatmen, who fearlessly launched their famous luggers in the teeth of a gale to go to the rescue of ships in distress in the Downs ; for until 1865, when the first lifeboat was stationed there, all life-saving was carried out in open beach boats.

Although evidently known from time immemorial in other lands, as evidenced by the Chinese junk, with her lug sails made from matting, stiffened with battens, and the Egyptian nuggar, the lug sail has been traced back in this country only to Tudor times. It was not until the eighteenth century that the rig became popular, and it owes its development chiefly to the French, who brought the lugger to a high state of perfection about 1770, using it for privateering, smuggling and trading. Its merits being proved by smugglers, who only went fishing in their spare time when all else failed, the lug sail was quickly adopted by the fishermen in many of our East and South Coast towns—although, strangely enough, Brixham never used the rig—it rapidly superseded the old-fashioned square-rigged herring buss, and remained in use right down to the last days of sail.

Tall and Narrow Sails

The sails of the old bluff bowed, beamy buss were tall and narrow, with the rigging not very widely spread at the masthead, hence the yards, which in square rig are always *outside* the rigging and before the mast, could be braced up quite sharp. On a wind, with tacks well bowsed down and yards peaked up, their square sails resembled lugs. It did not require much alteration of gear to convert from square to lug rig ; all that was necessary was to bring the yards *inside* between the rigging and sling them in a fore and aft position at about one-third from the fore end instead of in the middle, as it was soon found that the sail set better with the halyard nearer the throat.

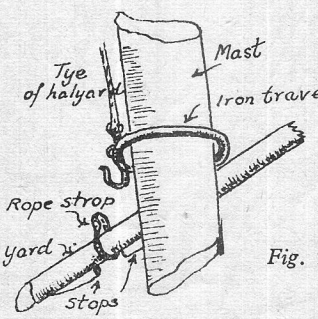


Fig. 1

This change in rig brought in an entirely new method of going about when working to windward, as the fore end (tack) of the lug always remains forward, instead of changing places every time the yards are swung round as in square rig.

It is a debatable point whether the lug was actually developed from the square sail as above or from the lateen of the Mediterranean by reducing the forward apex of the sail.

The lug is always four-sided, the sail is bent to the yard with rovings, usually called " knittles " by fishermen, and is slung in fore and aft position inside rigging. There are three kinds of lugs :

1. Dipping lug. This was much used, although very inconvenient except for long reaches, as on a wind the sail has to be dipped, i.e. lowered, and reset on the other side of mast every time the boat goes about. The tack of sail is carried to the stemhead, or the weather side, and well bowsed down, while the sheet is on lee side.

2. Standing lug. Here the sail is not lowered, so is alternately to leeward or windward of mast when beating to windward. The tack of sail goes permanently to foot of mast and sheet to lee side.

These lugsails, being loosefooted, do away with the weight of a heavy boom, always difficult to handle in a seaway and a constant source of danger should a sea break into the sail, especially when foot of sail was laced to boom. The sheet of a lug can be let fly in squalls, so relieving pressure.

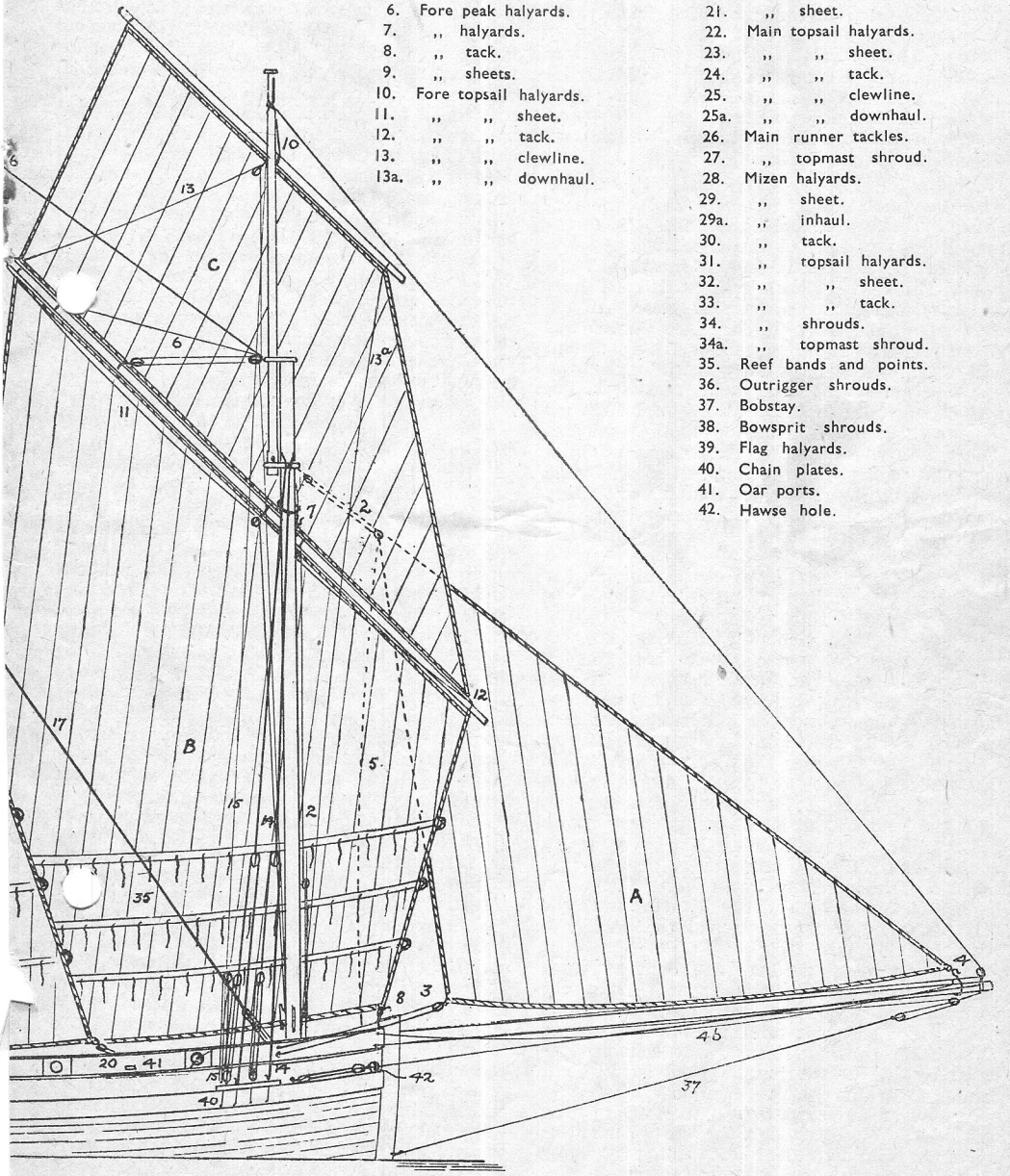
3. Balance lug. This is a modification of the standing lug, having a boom at foot of sail. It was very seldom used, save in small inshore boats, the only fishermen favouring it being the Orkney Islanders.

The Most Powerful Sail

The dipping lug has many advantages—it is the most powerful sail ever devised and being a lifting sail helps to keep a boat dry in a seaway. It needs no lofty mast, so little, if any, heavy standing rigging is required, thus reducing weight aloft. It is a very simple sail to handle, having none of the complicated gear of square rig, no lifts or braces are required to trim yard or buntlines, leachlines and clewlines to take in sail. When the single halyard is let go the sail falls with its own weight, and is down in a moment, and can easily be laid to one side out of the way. With well-cut canvas, set flat like a board, a lugger is very weatherly, outpointing every other type of vessel, being exceptionally fast on a wind or reaching, but not so good with wind well abaft beam or running. On the other hand, owing to the great length and weight of the yard and the need for dipping sail at every tack, a strong crew, large in proportion to size of vessel, had to be carried. This was of little account when smuggling, as many men were always needed for running cargoes. Great skill and care in handling was essential to dip and reset sail as the boat shot up into the wind before losing headway. Another problem was to keep

RIGGING

1. Fore topmast stay.
2. Jib halyards.
3. ,, sheets.
4. ,, tack.
4a. ,, outhaul.
4b. ,, inhaul.
5. ,, downhaul.
6. Fore peak halyards.
7. ,, halyards.
8. ,, tack.
9. ,, sheets.
10. Fore topsail halyards.
11. ,, ,, sheet.
12. ,, ,, tack.
13. ,, ,, clewline.
13a. ,, ,, downhaul.
14. Fore runner tackles.
15. Fore topmast shroud.
16. Main topmast stay.
17. Main stay.
18. ,, peak halyards.
19. ,, halyards.
20. ,, tack.
21. ,, sheet.
22. Main topsail halyards.
23. ,, ,, sheet.
24. ,, ,, tack.
25. ,, ,, clewline.
25a. ,, ,, downhaul.
26. Main runner tackles.
27. ,, topmast shroud.
28. Mizen halyards.
29. ,, sheet.
29a. ,, inhaul.
30. ,, tack.
31. ,, topsail halyards.
32. ,, ,, sheet.
33. ,, ,, tack.
34. ,, shrouds.
34a. ,, topmast shroud.
35. Reef bands and points.
36. Outrigger shrouds.
37. Bobstay.
38. Bowsprit shrouds.
39. Flag halyards.
40. Chain plates.
41. Oar ports.
42. Hawse hole.



am 20 ft. Armament, eight 4-pounders

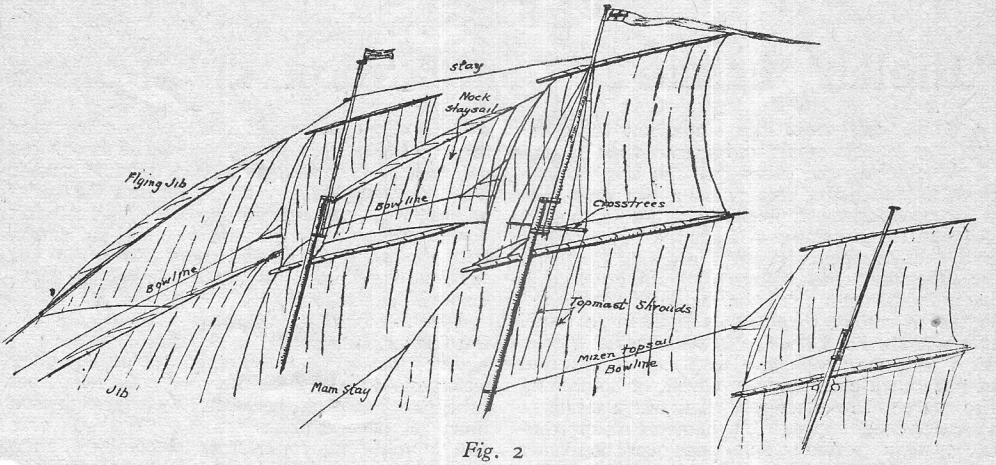


Fig. 2

fore and main, and sometimes but not always, on mizen. The sails were enormous and must have called for a high standard of seamanship. So fast were these luggers and so skilful did the smugglers become at evading the Revenue cutters that laws were passed regulating beam and making it a serious offence to build one too narrow. A favourite dodge for getting the utmost speed was to blacklead the bottom by rubbing in plumbago whilst the tar was still wet. Another trick was to keep the sails well drenched with water; on a reach it was reckoned that a boat with wet sails would sail 1 point nearer the wind than with dry sails. Eventually the Government was forced to build similar types, and these set a perfect cloud of canvas, including flying jib, and nock staysail (Fig. 2).

Yachtsmen were quick to see the advantages of the lugsail, and many well-known yachts were built on the lines of captured smuggling craft; so long as wages were low, it mattered little that a big crew was needed. One of the most famous was *New Moon*, built by George Tutt & Son at Hastings in 1859. She measured no less than 128 ft. on keel, with beam of 18 ft., registering 220 tons, and must have been a very powerful boat.

The lugger was quite capable of going long deep-sea voyages—in the early 1850s a 15-ton Mounts Bay boat, *The Mystery*, with a crew of five sailed from Penzance to Sydney by way of the Cape, and actually took on the mail from Cape Town to Sydney.

Speed

As regards speed, a few incidents must suffice—in 1885 a Newlyn lugger came home from Scarborough in 72 hours, while in 1910 three Penzance luggers sailed together from Mounts Bay to Scarborough in 70 hours, in spite of being becalmed at the Start for some time.

The Yarmouth three-masted luggers, known locally as "yawls," were considered the fastest open boats in the world; very fine lined, they seldom exceeded 8 ft. beam on a 50-ft. keel. When hard pressed reaching, water would rise 6 in. above lee gunwale, yet only a trickle would come aboard because of speed of boat. *Reindeer* logged 16 knots reaching in a stiff breeze, and so confident were her crew in her speed that they challenged the famous *America* to a match for £200 a side, but the owner of the yacht refused to race for less than 1,000 gns. a side, an impossible figure for fishermen to raise, so the opportunity was lost for ever of testing the sailing qualities of two such widely different craft.

Nearly everyone on the coast was more or less implicated in smuggling and many and ingenious were the hides and concealments used to bring in contraband by fishermen. At Folkestone they would put to sea with all the innocence in the world to fish; at a certain spot they would start to "creep" for tubs, hoist them on board and pour the spirits into the masts and oars. These were hollowed out and lined with tin and would hold several gallons of spirits. Even the handles of shrimping nets took about 2½ gallons. Having caught a few genuine fish, they came ashore under the eyes of the Excisemen, took the masts and oars out of the boat and, following the usual practice, carried them up the beach to their homes. This trick was given away by a drunken seaman, and the authorities raided the harbour, finding many craft so fitted, all of which were condemned for having places of concealment. False linings and double bulkheads with space between were other devices. Tubs were coated with rough plaster of paris and seaweed and dumped overboard full of spirits at high water close inshore. At low water they were picked up by carts ostensibly loading chalk for lime burning. They defied detection among the genuine lumps and the ruse was only discovered when a woman betrayed the secret to a lover. Barrels of pitch held a small cask of spirits; the pitch was run round and appeared to be solid.

In these expensive days it is interesting to note that the smugglers would sell the best Highland whisky at 8s. a gallon and still make a handsome profit, whilst brandy could be purchased in France for half-a-crown a gallon!!! Little wonder that smuggling was a popular pastime.

(To be continued)

your ears that the provision of four superheater flues also has something to do with it, so we'll leave it at that. Anyway, cut four pieces of $\frac{3}{4}$-in. by 20-gauge seamless copper tube, and sixteen pieces of $\frac{5}{8}$-in. by 22-gauge, to a length which will allow them to be squared off in the lathe at each end, and finish to $11\frac{1}{4}$ in. Your humble servant is lucky here, because some years ago a kind friend presented him with a miniature tube cutter, as used by plumbers and gas-fitters. It cuts tubes up to 1 in. diameter, the tube being held between three rollers, two of which are grooved, and one knife-edged. The latter is forced into contact with the tube by a screw with a knurled knob, and if the gadget is placed on the tube, the knob tightened, and the whole doings revolved around the tube a few times, the cut *is* made clean and square, and needs no turning. Tip for beginners: if your lathe hasn't a hollow mandrel, or if it has one too small to admit the tube, make a little wooden steady, as shown in the illustration, from a couple of bits of wood screwed together at right-angles and held to the lathe bed or saddle by a coach-bolt. Drill it with a drill in the chuck; you can push it along the lathe bed by hand, as wood drills very easily. Hold one end of the tube to be squared-off, in the three-jaw, and let the other end poke about $\frac{1}{2}$ in. through the hole in the steady, giving it a spot of oil. You can then use a knife tool for squaring off, without any fear of damaging the tube. Clean the ends of the tube with a bit of fine emery-cloth whilst revolving.

As you cannot get at the under-side of the tubeplate with the blow-lamp flame, and it would be a ticklish job to get the whole issue properly heated if all tubes were put in at once, it is advisable to silver-solder the tubes in two instalments. First put in the four superheater flues and the top row of $\frac{5}{8}$-in. tubes. They should be a tight fit in the holes in the combustion-chamber tubeplate, and project through about 1/32 in. Then put the smokebox tubeplate on the outer end, to hold them at correct spacing. Carefully line them up so that they are parallel with the top and sides of the combustion chamber, and square with the tubeplate. Stand the assembly in the brazing pan, with the tubes pointing skyward, and smear some wet flux right around each tube. As only two rows are left, they are all get-at-able. "Easyflo" is about the best for this job, with its special flux; failing that, use best grade silver-solder, and powdered borax mixed to a paste with water. Cut the silver-solder into narrow strips, and use the little tongs to apply it. "Easyflo" can be obtained in either strip or wire form; a personal friend, Mr. T. Hearn, of Watford, uses the wire, winding it up in the same way as you would wind an axlebox spring, cutting it into single rings, and placing one ring around each tube. This is pressed into close contact with the tube-plate, and the whole lot covered with wet flux. When the job is heated to the right temperature, the rings simply melt into the countersinks, sealing in the tubes perfectly, and that is all there is to it!

To do the job in the ordinary way, first pile up the coke or breeze all around the chamber, almost to tube-plate level; then get the blow-lamp going strong, and first of all, heat up the tubeplate. When this begins to glow, blow a little on the tubes, but don't keep the flame too long in one place, or you may overheat them and burn the copper. Attend to the thicker superheater flues first. When the whole lot—end of chamber, tubeplate, and tubes—reach a nice medium red, and the flux has fused, apply a strip of silver-solder to each tube. A little will immediately melt off, and "flash" right around the tube, making a perfect seal. *Don't overheat*; you can tell at once if this is happening, by the silver-solder starting to "boil and bubble." Eh—what's that? Yes, I know perfectly well, that the secret of good brazing is plenty of heat; but, as before stated, you can have too much of a good thing. The doctor told his patient that a spoonful of the prescribed tonic each day, would ensure a slow but complete cure; the *im*patient thought that by taking the lot at once, it would finish the job much quicker. It did—the verdict was "Death by misadventure." In the present case, the right amount of heat, is the temperature at which the brazing material will melt and flow freely. With "Easyflo," this is a dull red; with best grade (usually known as No. 1) silver-solder, it is very little higher, just medium red. At the right temperature, the silver alloys with the copper and makes a perfect joint, smooth, even, and free from pin-holes. If any beginner is at all doubtful, drill a $\frac{5}{8}$-in. hole in any scrap bit of copper, stick an odd end of $\frac{5}{8}$-in. tube in it, stand it on the coke and have a trial run. Young Curly got a lot of his knowledge and experience that way. Try it in late evening, or in a dark corner (*not* in your workshop!) and you'll learn how to judge temperature by the colour of the heated metal, better than I could tell you in pages of instructions.

Let cool to black, quench out in pickle, wash off and clean up, put in the two bottom rows of tubes, and ditto repeato the whole process. Beginners will most probably say, why quench out and cool off the lot; why not put in the other tubes whilst the job is still hot, and save reheating from cold. All right, try it and see how many tubes you get into the hot combustion chamber. If you do get them in, the wet flux will flash off as soon as put on; and even if the job cooled sufficiently, whilst inserting the rest of the tubes, to allow it to be fluxed properly, the oxidation of the metal during the first heating, would effectually prevent the silver-solder "taking," and the job would be a failure. The only satisfactory way, is as described above; the first pickling removes all the oxide from the first heating, so that the second stage of the proceedings goes through in the approved manner, with reliable results. I hope our more experienced members of the locomotive-building fraternity won't be impatient at these L-card digressions; but I get so many letters from novices, full of complaints about failures, that it really saves time to point out possible pitfalls to them, before they have a chance to tumble in. *And* all the novices who are pluckily attacking the "Lassie" job, are eager for full success!

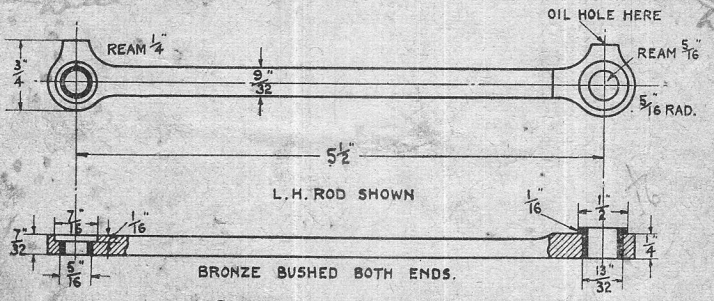
Before quenching the second tube job, as it is

Taunton, going strong the last time I heard of her. Incidentally, I hear from the Malden club that one of the fastest engines yet seen on their road is a "Molly," another 0-6-0 built to your humble servant's instructions. The fastest engine in 2½-in. gauge which has performed on the Romford line, is yet another "Live Steamer" (L.M.S. 5XP "Olympiade" type) owned and driven by Eddie Bailey, which knocked up 11½ miles per hour hauling Eddie's eleven stone of live meat. That is some going, too, as anybody who has done it even on 3½-in. gauge will fully agree; and although the run was not "officially" timed, it is quite authentic.

Arthur Chapman himself is building a "Hielan' Lassie" with *four* cylinders and the eight-beat setting, using slide-valve cylinders, Baker gear outside, and Holcroft inside; that looks like being the "Queen of the Lassies!" Another interesting job will be John Clancey's L.N.E.R. K3 2-6-0. Locomotive-building has done quite a lot for John; through sustaining "personal damage," he developed cerebral trouble which has rendered him unconscious for sometimes as much as 36 hours at a stretch, yet he carries on, and has built a gauge "O" coal-fired 4-6-2 which is the great delight of his small son. Space does not permit a full list of the other engines now under way; but the workshop superintendent, Bill Killey, says that Stan Carr has offered a 3½-in. Drummond lathe on indefinite loan, and it is now being installed in the workshop, to help matters along. Though, a[illegible] some of the pioneers of the Romford club track have passed on—one was killed in an air raid at his own front door—George Larter and a few others are still carrying on the good work. Here's wishing the best of luck to the "Old Firm!"

Coupling-rods for "Juliet"

We'll hang the tail lamp on this week's notes by giving a sketch of the coupling-rods for "Juliet." No special description is needed, just follow the instructions given for the "Lassie" and other engines previously described. The rods themselves are made from two pieces of ¾-in. by ¼-in. mild steel bar, either milled, or sawn and filed to shape. Anybody who feels energetic can put a flute in, if he so desires; it makes the rods look pretty, but doesn't have any effect on the working. "Old Billy" never specified fluted rods, he just had them painted; and the cleaner boys used to scour up the bosses and the crankpins like silver, which effectively "set off" the maroon colour. Engine-cleaning can now be reckoned as one of the lost arts in these "enlightened" days! Turn the bushes out of phosphor-bronze drawn rod, if possible; if not available, use hard brass. The hole for the bush in the leading end is drilled 5/16-in., and in the driving end 13/32-in. The bushes should just project the weeniest bit, not more than 1/64 in. at the outside, on the backs of the rods, to keep them from rubbing over the full face of the wheel bosses. The recess in the leading end is pin-drilled 1/16 in. deep, to suit the retaining washer.



Coupling-rods for "Juliet"

Petrol Engine Topics

(*Continued from page* 528)

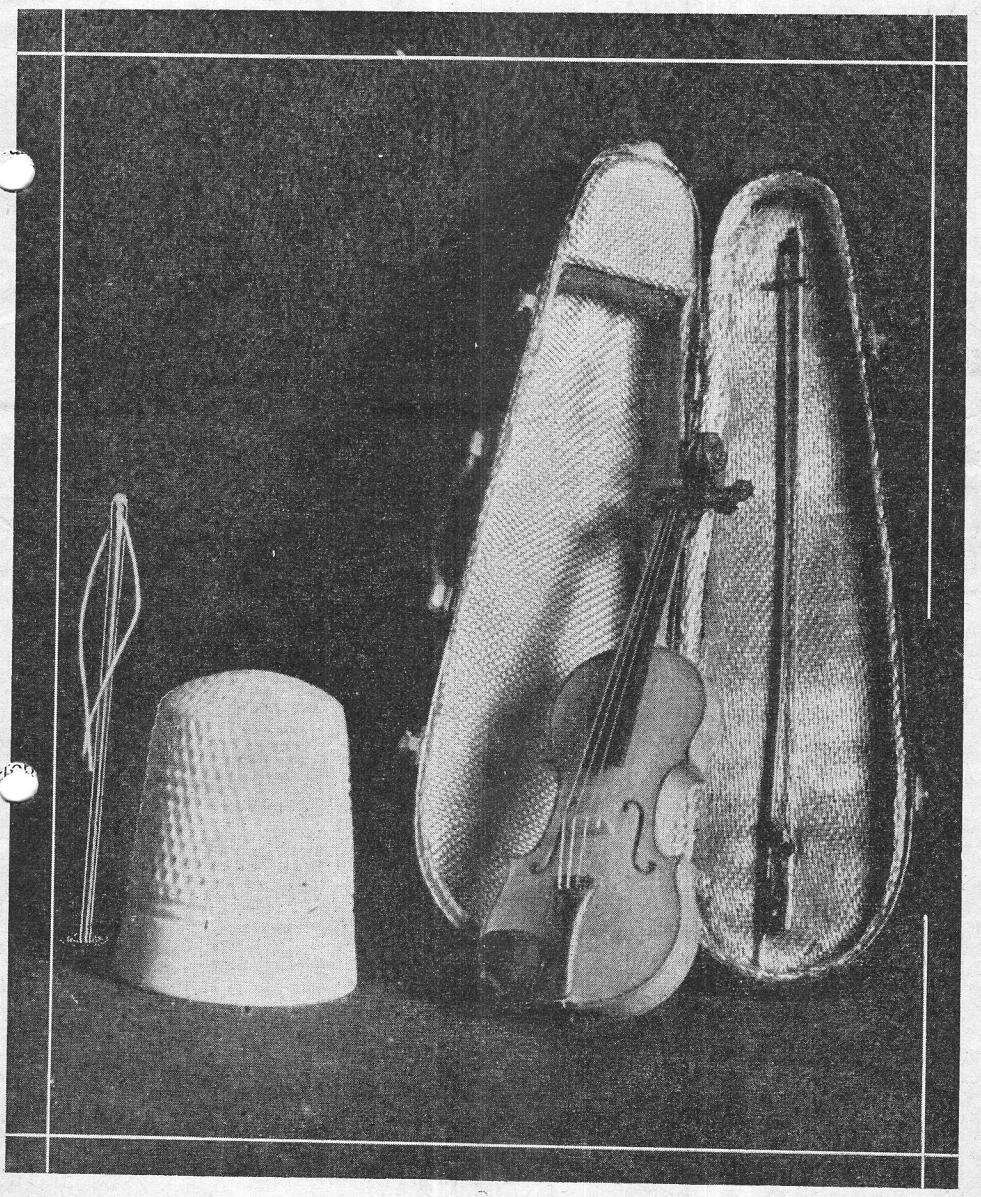
argument as to which was correct, "teaspoonsful" or "teaspoonfuls." Personally, I don't care a soup ladle which is correct so long as I understand exactly what is meant by either term—which, incidentally, is not a very precise one from the technical point of view. Just recently a discussion has arisen as to the correct way to spell "carburettor." I have always used the spelling given, following the precedent set by many leading authorities and technical journals on automobile engineering. But I know that other and equally competent authorities spell the word with a final "er"; and no doubt they are equally correct. On further investigation, however, I find there are no less than five different ways of spelling the word which have been used in publications issued in the English language; but you or I understand exactly what is meant, whether it is spelt carburettor, carburetter, carborator, carbureter, or even carburateur! Any further argument on this and other similar variations of spelling may safely be left to the pedants.

A MINIATURE VIOLIN

By J. M. BALL

UNDER the title "The Cult of the Model," there was recently published what was, to me, a most interesting article, and one which, in the last few lines mentioned a subject I have always been interested in, namely, the making of models for posterity, and the fact that the article mentions the possibility of modelling some of the work of that great artist in musical instruments — Stradivarius.

In a Sunday newspaper in December, 1937, my attention was drawn to a small photograph of a human hand holding a very small violin and bow. The caption stated—"This is the world's smallest 'Real' violin, made by Anton Ostrizek, of Vienna, just over two inches long and a perfectly proportioned miniature of a Stradivarius.



Victoria Station, Manchester. Mr. Gibbon, the company's representative, was a past master at his subject and our enjoyment was largely due, thanks to his efforts on our behalf. Club meetings each Friday evening, 8 p.m., Girls Institute, Mill Street, Ancoats.

Hon. Secretary: J. MEADOWS, 90, Bank Street, Clayton, Manchester.

Birmingham Society of Model Engineers

Future meetings, on Wednesdays, at the White Horse, Congreve Street, Birmingham, 7 p.m., will be :—

Dec. 4th, 1946 : Film show, "Steam," by Messrs. Babcock and Wilcox. Ladies invited.

Dec. 18th : Open meeting.

Jan. 1st, 1947 : Auction sale of spare tools, lathes or $\frac{1}{16}$-in. hexagon Whitworth bolts, among other things.

Jan. 15th : Film show. A collection of scenes by Messrs. Campbell and Mills. Come and see yourself on the screen. Ladies invited.

Hon. Social Secretary: B. HUMPHREYS, 94, Beeches Drive, Erdington, Birmingham.

Brighton and District Society of Model and Experimental Engineers

An excellent lecture was given by Mr. Paulin on "Pumps and Pumping Machinery," dating from the earliest known types to present-day practice, very ably demonstrated with sketches on the black-board. This meeting was held "out of turn," owing to the November 1st elections. Our next meeting will be held on November 29th, when there will be a discussion on steam v. petrol for power.

December 13th will be the last meeting this year, and many members are eagerly looking forward to the lecture on "Ships and Boats," to be given on that date. Visitors will be welcomed at any meeting. Particulars of membership from E. L. MEAD, 73, Langdale Gardens, Hove, Sussex.

Stephenson Locomotive Society

The large meeting room at the society's new headquarters, West Kensington, London, was crowded before the commencement of Mr. R. A. H. Weight's lantern lecture : "A Locomotive Story of the East-Coast Route," on October 14th, the first general meeting at this venue. Interesting slides exhibited included : a portrait of Geo. Stephenson, his *Locomotion*, Hackworth's *Derwent*, Stockton & Darlington 0-6-0, Sturrock and Stirling 2-4-0s, the actual G.N., N.E., and N.B., engines taking part on the fastest run of the race to Aberdeen in 1895, a copy of a special G.N. working notice issued in connection therewith, "Atlantics" of the three companies operating the East-Coast route prior to 1923, a set illustrating the construction of a "Pacific" at Doncaster from frames to finished locomotive, the corridor tender and various views of the non-stop Flying Scotsman, Raven's *City of Newcastle*, following on to a selection of Gresley types up to the streamliners and *Cock o' the North* ; the whole being accompanied by an impromptu commentary, which included footplate and other reminiscences.

The annual meetings at the main provincial centres in Manchester, Glasgow and Newcastle-on-Tyne were well attended, sound progress as well as strongly increased memberships being reported. A good programme of winter meetings, lectures, etc., has been arranged in those cities, as also in London, Edinburgh and Leeds.

Hon. Secretary : H. C. CASSERLEY, Ravensbourne, Berkhamsted, Herts.

Portsmouth Model Engineering Society

The Lecture Room, Central Library, was packed to capacity on November 6th, when a lecture "The Influence of Scale Dimensions upon Model Locomotive Designs," was given by Mr. J. N. Maskelyne, Editor of THE MODEL ENGINEER.

The attendance of Mr. J. N. Maskelyne, and his wide knowledge of a subject equally of great interest to all sections of the society, and the large number of students of the engineering section of the Municipal College, who were welcomed as visitors, proved to be an outstanding event in the history of the society.

In his replies to the many and varied questions on locomotive matters, Mr. J. N. Maskelyne touched upon the evolution of railway tracks from early history to present day standards, and the many and varied complexities of running rolling stock to a complete schedule.

The Secretary staged a small show of models, covering every section of the society's activities, and it was particularly gratifying to have Mr. J. N. Maskelyne's comments upon the excellence and craftsmanship of the models shown. The chairman, Mr. T. A. Bedford, extended a warm welcome to Mr. J. N. Maskelyne, Sir Denis Daley (a society patron), Lady Daley, and visitors.

Commander L. A. Brown, R.N.V.R., vice-chairman, in his vote of thanks to Mr. J. N. Maskelyne for his instructive and very interesting lecture, eulogised his services for model engineers and expressed the wish that the society would be honoured with another visit in the near future.

Mr. Jubber, the "Summerscales Cup" winner, supported the vote of thanks, which was loudly acclaimed.

There will be an informal gathering, on December 4th, at the Lecture Room, Central Library, at 7 p.m. Lecture by Mr. G. Hodgson (a club member) on "Cutting-Tools."

All enquiries to the Hon. Secretary : H. A. HANSFORD, 5, Milton Road, Portsmouth.

NOTICES

The Editor invites correspondence and original contributions on all small power engineering and electrical subjects, which should be addressed to him at 23, Great Queen Street, London, W.C.2. Matter intended for publication should be clearly written, and should invariably bear the sender's name and address.

Readers desiring to see the Editor personally can only do so by making an appointment in advance.

All correspondence relating to sales of the paper and books to be addressed to THE SALES MANAGER, Percival Marshall and Co. Ltd., 23, Great Queen Street, London, W.C.2.

Correspondence relating to display advertisements to be addressed to THE ADVERTISEMENT MANAGER, "The Model Engineer," 23, Great Queen Street, London, W.C.2.

ELECTRICAL EQUIPMENT

Electradix Bargains include :—

Dynamo and Motor Generator Bargains. G.E.C. double current Dynamos, 6 volts, 5 amps., 600 volts, 80 m.a., ball-bearings, 17 lb., as new, 37s. 6d., carriage paid, 5s. refunded on returned packing case. D.C. Dynamos, 12 volts, 10 amps., £4 10s.; 30 volts, 5 amps., £7 10s.; control box, fitted cut-out and regulator, 21s.; 120 volts, 4/5 amps., D.C. Dynamos, £8 10s.—Below.

Small D.C./D.C. Motor Generators by leading makers for use in Radio Receivers to take the place of H.T. battery, 6 volts input, 110 volts, 15 m.a. output, or 12 volts input, 230 volts, 30 m.a. output, £3 15s., weight only 5½ lb., size 5½" × 3½" × 3½", model finish, ball bearings, 2-comms., 2 separate windings, waterproofed.—Below.

Transformers, 3 K.W. Crypto, 230 volts to 115 volts, 28 amps., £9 10s.; to small Bell Transformers, 230/3/58 volts, 7s. 6d. Transformers for Rewind, 3 K.W. with stampings, 4½" × 6" × 7½", windings damaged by blitz, weight with damaged wire, 65 lb., 45s., carriage extra.—ELECTRADIX, 214, Queenstown Road, London, S.W.8.

New ex R.A.F. open type, 2 volt, amp. Solenoid Switches, with cket fixing, 3s. each.—Below.

Rotax 24 V. A.C.-D.C. reversible 0.07 h.p. Electric Motors, fitted with reduction gearbox, auto switch, solenoid brake and overhead clutch, with adjustable setting from 4.25 ft./lb., diameter 3⅛" × 12", weight 9 lb. Made regardless of cost, now at bargain price, £1 1s., including postage.—Below.

Brand New ex-Gov. Thermostats, steel glass tube type, mounted on S.B.C. double contact lamp base, settings between 40 and 50 C., suitable for fire alarms or warning signal for overheating, 4s. each.—Below.

Best Bargain Yet! Large number of brand new Rotax Dynamotors, 24 v., delivering 95 v., with high amps. Will work on 12 and 6 v. Could possibly be made into welding plant, or as a motor for driving machinery, very powerful. Cost Gov. originally £30, now at a gift, £1 5s. each, including carriage.—EMMS, 68, "Redcliffe," Old Brompton Road, S.W.5. Flaxman 3634.

£3 5s. 0d., 8" diameter Exhaust Fans, porthole type, 200/250 volts, 50 cycles, single phase, 1,200 t.p.m., new.—JOHNSON ENGINEERING, 319, Kennington Road, S.E.11.—RELiance 1412/3.

Electrical Motors, reversible, A.C./D.C., 4-24 volts, 2½" × 2" × 1⅜", 10 ozs., ideal for models, runs off batteries or transformer, 25s. 8d.—EMCO, 118, Foleshill Road, Coventry.

For Sale, 6 volt Car Dynamo (Austin 7), 25s.; also 12 volt Wiper Motor, 10s. h new condition.—61, Knightlow , Birmingham.

Phillips' Seven Valve all wave Communications Receiver, as supplied to Forces. As new, in cartons. Tremendous range. Too powerful for owner's requirements, £20.—MACLEOD, "Dallas," Boat of Garten, Inverness-shire.

Radio Converters, 19 volts, 4.7 amps. input, dual output, L.T., 12 volts, 2 amps., H.T., 300 volts, 0.7 amp., new, £4 10s. each, carriage paid.—R. F. WINDER LTD., Cross Belgrave Street, Leeds 2.

Transformers, Input 230 volts. Output 20 volts, 3 amps., with 12 volt tapping, 22s. 6d. each; Auto Transformers, 230 volts to 110 volts at 1½ amps., 24s. 6d. each. All post free. Other sizes made to order.—EELES, 68, College Road, Isleworth, Middx.

GENERAL

"Model Engineers," 1929 to 1939, complete, £6; Ball-races, 20 ⅜" bore, 10 ⅝" bore, 14 ½" bore, 10 ¾" bore, aligning, £4; Dynamos, 50 volt, 10 amp., £6; 12 volt, 7 amp., £1 10s.; 16 volt, 12 amp., £4; Motor, 1 h.p., 100 volts, £6; Motor, ½ h.p., 100 volts, £3; Motor Generator, 12 volt input, 1,500 output, £2; Vertical Steam Engine, slide valve, 2½" bore, 3" stroke, double web crank, £3; air-cooled two-stroke Petrol Engine, magneto, pipes and carburretor, £2 10s; rolled and polished Brass Plate, 30" × 6" × ¼", 25s. Write for particulars.—LOYD, 121, Abercynon Road, Abercynon, Glam., S. Wales.

Wanted, MODEL ENGINEER, volumes previous to No. 54, must be complete; also the following issues: 1360, 1387, 1391, 1567, 1716, 1763.—104, Micklegate, York.

Detached Modern House for sale, Skegness, Lincolnshire; 4 bedrooms, bathroom, separate lavatory, lounge, morning room, kitchen, downstairs cloakroom, with lavatory and washbasin, centrally heated throughout, brick garage. Approx. 400 ft. true scale "O" gauge track, electrically operated points, etc., on thick plywood, layout in false roof. Full details on application.—Box No. 4205, MODEL ENGINEER Offices.

Wanted, MODEL ENGINEER, 2360; also 50 volt ¼ h.p. Motor.—HANSON, Verwood, Dorset.

Pair Bassett-Lowke Cylinders, 5" × 1", 30s.—100, Ellerdine Rd., Hounslow.

Eeorograph 2 gallon paint pressure container, all fittings, except gauge, 100 lb./sq. in., Hand Mixer, as new, £5; B.S.H. 500 c.c. S.V. 1938 Motor Cycle Engine, hardly used, £8; 230 volt A.C. single phase 1/3 h.p. Electric Motor, tested, £4 10s. S.A.E. Packing, carriage, extra.—LITTLEWOOD & DENTON, 25, Haugh Lane, Wombwell.

Toymakers' Super Casting Moulds for Lead Toys and Plaster Craft. Over 100 latest designs. Fully illustrated catalogue, 1s. 6d., P.O.—AGASEE, 7, Stradbroke Road, Highbury Barn, N.5.

Wanted, 3½" or 5" Coal-fired Locomotive, complete, in any condition, cheap.—T. SELLARS, "The Marsh," Leonard Stanley, Stonehouse, Gloucestershire.

Wanted, "South Bend" Bench Lathe, "Model A." Your price paid. Also MODEL ENGINEER, Vol. 79, unbound.—WEBB, 9, Roberts Road, Acocks-Green, Birmingham 27.

Wanted, MODEL ENGINEER, No. 2368, dated September 26th.—HUGHES, 39, Kylemore Avenue, Liverpool 18.

"Model Engineers," Vols. 82-91, bound, £7 10s.; Vols. 92-94, unbound, £1 10s. All perfect condition.—BUTCHER, 1, Colenso Street, West Hartlepool.

Welding, Brazing and Soldering service to model makers. Write—TURNER, 3, Victoria House, High Road, Goodmayes, Essex.

Keen Model Engineer required by Firm of Experimental Electrical Engineers, S.W. London. Good prospects for neat, tidy worker with initiative and knowledge of small machine shop practice. Write, stating age and full particulars.—Box No. 4215, MODEL ENGINEER Offices.

"Model Engineers," November, 1938, to August, 1946, 3 copies missing, nearest £5.—4, Stretton Lane, Wolston, Nr. Coventry.

Powerful Foot-bellows, new, never used, £4, exchange large blowlamp.—COLLIER, 90, Chudleigh Road, Kingsteignton, Devon.

Wanted, "Model Engineers," 2053, 2054, 2184, 2294, 2295.—HURRY, 5, Causeway, Arundel, Sussex.

Wanted, complete or broken set of the "English Mechanic." Am willing to pay a very satisfactory price.—A. SPIRO, 2683, Buena Vista Avenue, Detroit 6, Michigan, U.S.A.

Drawings and Tracings, blueprints if desired, and perspectives from sketch or notes, experienced draughtsman.—G. A. WHITE, 21, Meadway Court, Hampstead Garden Suburb, N.W.11.

Experienced Fitter-Turner required for light engineering work, one with model making interests preferred. Also boy required for general shop work.—BOND'S, 357, Euston Road, N.W.1.

Watch and Clock Making. If interested you can get all tools and parts, also wheels cut from—JOHN MORRIS, 64, Clerkenwell Road, E.C.1. Regret no posts or lists, only counter service at present.

Watchmakers Demobbed need Lathes to start work again. John Morris (Clerkenwell) Ltd. will pay high prices for Lathes by Lorch, Boley, Wolf Jahn, and American and Swiss makes.—64, Clerkenwell Road, E.C.1. CLE. 6077.

New Steam Engine Drawings. Send P.C. for details.—DRABBLE & SONS, 10, Ashton Drive, Hunt's Cross, Liverpool. Trade enquiries invited.

Model Engineers. Wanted good all round Turner, also boy. Apply—C. T. WOOLER (ENG.) LTD., 11, Alperton Viaduct, Wembley, Middx.

indeed a tribute to the virtues of experimental engineering. Similarly with the small petrol motors, particularly in the 5-c.c. and 10-c.c. types, much patient and intelligent experimental work has been done in evolving the most suitable carburettors, spark plugs, lubrication and ignition systems, and indeed in the very metals employed in construction. Instead of a rather lumpy spluttering engine working mainly by more "fits" than "starts" the modern miniature i.c. motor is a gem of elegant appearance and consistent running. So too with the electric locomotive, the aeroplane and the model racing car, the experimentalist has been busy and has most encouraging results to show for his inventive thought and hours of patient handicraft skill. Apart from some modest imitations of "stream-lining" the "live steam" enthusiast has been content with following the "words and music" so ably written for him by the master composers. The steam turbine locomotive is still in the experimental stage, but our "live steam" friends will certainly raise an eyebrow at the latest project of the G.W.R. This, it has been announced, is to be a gas-turbine locomotive embodying some of the principles of jet propulsion, with an output of 2,500 h.p. and a speed of 90 m.p.h. There is obviously some experimental work awaiting those who are anxious that their babies on the track should emulate the propulsive methods of their big brothers of the real railroad. It is an age of progress, and may the experimentalists among model engineers keep pace with the march of technical design and achievements.

A Basingstoke Brotherhood

A NEW society has been formed at Basingstoke, with an initial membership of 50. The Hon. Secretary is Mr. G. Mabe, 59, Oakley Lane, East Oakley, Basingstoke. With so much of engineering interest in this district the Society should have a very successful future. I understand it came about as the result of a lecture "Is a hobby worth while?" and an exhibition at the Town Hall, organised by Mr. W. H. Crothall, who has been most energetic in the county in promoting local meetings and model displays. My best wishes to Mr. Crothall in his model "Crusade."

The Flight of Time

A CORRESPONDENT who makes some useful comments on the organisation of THE MODEL ENGINEER Exhibition, winds up his letter with an amusing complaint. He says: "Could not the clocks at the Exhibition be arranged to work at the normal speed, instead of twice or thrice as quickly? Even the 'Congreve' clock was in the conspiracy this year, and 'Time' is called, as it seems, before one has had time to do more than glance round." There will be many sympathisers with this point of view, but clever as model engineers are in recording the passage of time with their beautifully-made clocks, they cannot control it, or delay it. If we tried to help our correspondent by putting all the clocks back for a couple of hours, how would he catch his last train home? The only practical remedy for his problem is to come often, and come early!

Scientific Prophecy

I SOMETIMES take pleasure in browsing over books of bygone days and am interested in the forecasts of scientific progress which the authors sometimes venture to make. I have, for example, recently been reading a book entitled *Electricity up-to-Date*, written by Mr. J. B. Verity and published fifty years ago. We all know the advances made by electrical science in the last half-century and to present-day eyes the book and its illustrations are naturally very old-fashioned. But at its time of publication it gave an excellent summary of the state of the art, and the author did not hesitate to forecast many developments which he considered probable. In particular, he wrote: "An expectant world is ready to receive the invention by which the letter telegraph shall convey our actual writing as the telephone conveys our speech, and is awaiting the instrument by which our speech shall be conveyed to a distance without any connecting wire." Both these expectations have been realised and exceeded by the marvels of radio diffusion, which as we know, not only transmits the voice and writing, but photographs and pictures as well. The radio transmission of light and power in usable measure still belongs to the future. Some later editor of THE MODEL ENGINEER will no doubt discourse on these achievements in his "Smoke Rings" when they come to pass. I remember that the name of John Perry, the revered engineering professor of my student days, was associated with a prophecy that an attachment to the telephone would be produced which would enable callers to see the face of the person to whom they were speaking. This attachment is still missing; whether it would always be a blessing I am not prepared to say!

Societies Meet at Southampton

ON Sunday, November 3rd, six societies met at the headquarters of the Southampton Society and agreed to form the Southern Federation of Model Engineers, with an invitation to other societies to join them. Salisbury, Bournemouth, Newport (Isle of Wight), Portsmouth, Southampton and Andover were represented, under the chairmanship of Mr. H. O. Doughty, of Andover, and proceeded to iron out the various problems associated with such an organisation. The agenda, having been previously tabulated by the committee of the Andover Society, covered many subjects, chief among which was the desire of all societies to give mutual and material assistance to associated bodies in the interests of model engineers and to give an opportunity to scattered groups of such enthusiasts of forming a society in their particular district. Another project mentioned was opportunities of societies being given facilities in the several Town Planning Schemes to entertain the public and assist in education. The Federation secretary's address is Mr. R. Pemble, 14, Weyhill Road, Andover.

Percival Marshall

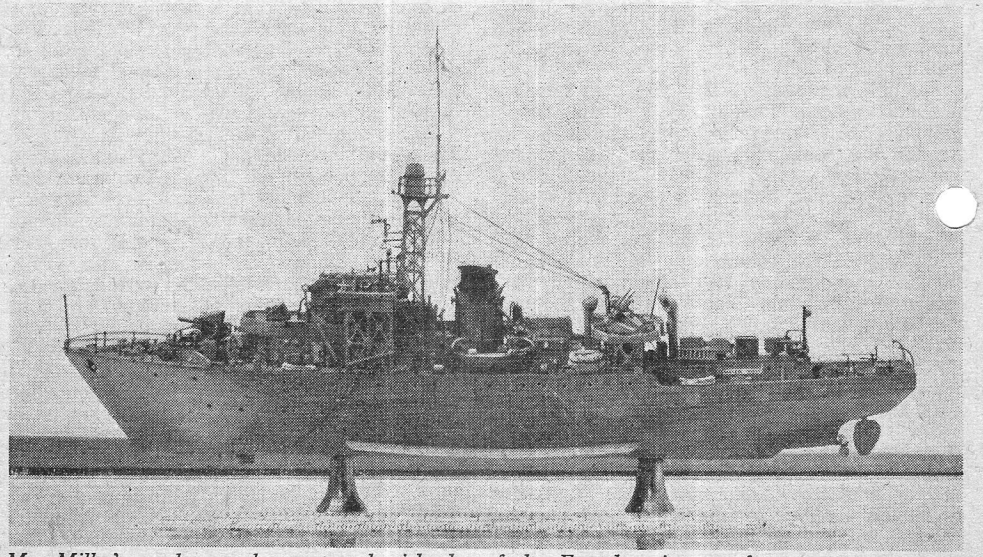
Bow view of a waterline model (about 30 in. long) at ½-in. scale of a Diesel yacht. Quite realistic. By W. R. Finch, Potters Bar

throughout. "Hearty congratulations, Mr. Bell, on your well-earned success. It was twelve and a half years well spent."

Mr. Hume won the Silver Medal for his work on a "period" model. Like the *Kobenhavn*, *L'Aigle* was a full-hull model, but the *L'Aigle* drew ahead slightly in being timbered and planked. The rigging, both standing and running, was a treat to examine. She was fitted with sails, and well-made sails, too, but I really must remark on the beautifully silken-*white* anchor cable. It may have been true of this particular ship, but I doubt if the French were *so* fastidious, even though they were the best ship designers in the world at that time. To you also, Mr. Hume, hearty congratulations on a fine piece of work.

This year the realists and engineers win, but if they are to continue their hold they must tone down the brightness of the brass fittings, for example, by using bronze or a suitable liquid colouring. I will content myself by saying that there was a considerable following for *L'Aigle*. Really, as I said earlier, it is just two schools where in modern sh[illegible] the predominating feature is that of metal deck-fittings. This seems to offend the other school, mainly because the use of brass seems to hit the eye. It will be patent to most that there is room for both schools, and plenty of room, too.

There were two other cups. The Championship Cup for the best Steamship model was won by S. T. P. Tilley (Northampton) with his eight-foot model of a Yarmouth drifter. She was a power boat with a compound steam engine. She was timbered and planked and has already had a useful career. Here was no fancy "spit and polish" effect. She was sturdy and robust, the tough guy of the rip-roaring North Sea. She was a favourite of everybody, sail or steam, powered or cased. If ever you've seen that well-known



Mr. Miller's work may be compared with that of the French prisoners of war, 150 years ago. Photograph shows the actual size of the model. That tower amidships is built up of pieces of wood. Wood only was used, apart from some fine silk (A bronze medallist)

standard and it would seem that these are natural followers on the 1938 year, which was the last time an Exhibition was held. It will be remembered that the 1939 Exhibition was cancelled at the last moment. I can give unstinted praise to many models for clean workmanship, excellently scaled and coloured rigging and really good "seas." The Hampshire Prize was won by Mr. Burrage (Ewell) with his very fine *Queen Mary* to the unusual scale of 1/60 in. Here was a model in the Hampshire manner which at first fooled me, for I thought it was by Mr. Hampshire himself. We shall all look forward to more and better work from this artist. A whiter wake, please, Mr. Burrage.

The *Morpeth Castle*, a wartime corvette, earned a Bronze Medal for Mr. Miller (Brighouse, Yorks). This attracted much attention and some controversy. This was a miniature after Mr. Miller, and no one else. It was made at sea, and the pity of it is that the creator got no, or very little, "ship effect." I imagine Mr. Miller to be a lone worker. His craftsmanship, allied to the selection of natural coloured materials, will make him a serious contender for cup honours even though he is a miniaturist. Let me be blunt. Mr. Miller, you made a wonderful wood-work job. You felt that you could not paint *The Morpeth Castle*. Partly correct! The hull could have been painted. Experiment with bristles from the deck brooms, old second-hand photographic films in all shades from transparency to black through all gradations of grey. This will be a start. Other ideas will come to you. Amyl acetate is the solvent for films. Nevertheless, a very fine job. Two blobs of colour I noticed. Green silk in a single strand or thread looks excellent as part of your rigging, but when coiled in the mass was an unmistakable green on a one-kind-of-wood-in-the-raw.

I still have some half-dozen medallists to mention, not forgetting some more helpful criticisms.

(To be continued)

For the Bookshelf

Models in Cardboard. By C. Baker. (London: Percival Marshall and Co. Ltd.) Price 5s. od. net.

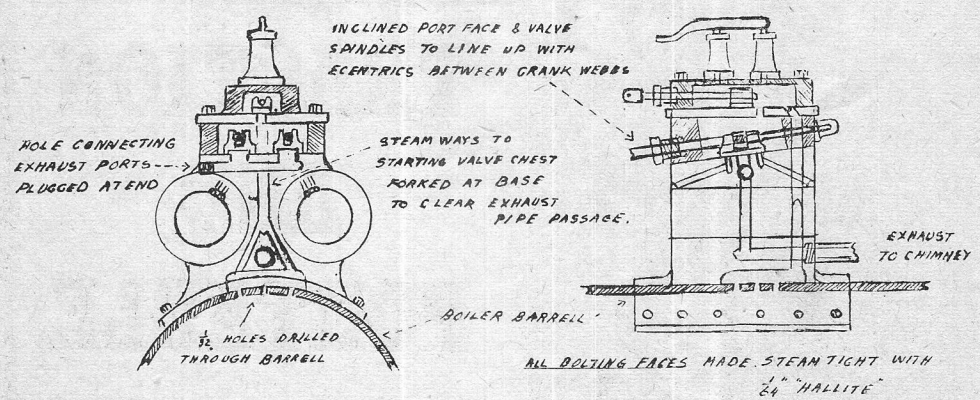
There are many followers of the model-making hobby who do not possess the equipment necessary to produce models in metal, but who are actuated by a strong urge to make models out of paper, cardboard or wood, or, perhaps, all three. Few, however, fully realise, at first, that much time and trouble can be saved, even with these modest materials and the simplest of tools, if a practical working knowledge of the craft can be acquired. Mr. Baker's book has been written with a view to filling this need, and covers a very wide range of possibilities. The author has built many different models in cardboard and has thereby acquired a considerable practical knowledge of his subject; moreover, he has the knack of making good sketches, and has profusely illustrated his book with them. Many photographic reproductions help to show just what can be accomplished by the enthusiastic builder of models in cardboard. The range of subjects is broadly classified under such headings as: Locomotives, Road and Rail Rolling-Stock, Ships, Aircraft and Architectural models; but each is sub-divided into its relevant details and variations, all of which are fully explained. If we may venture a criticism, it is that Mr. Baker does not appear to have laid quite sufficient emphasis upon methods of treating different grades of cardboard to ensure the durability of a finished model. Cardboard is very prone to suffer from the effects of damp, changes of temperature and even, in some cases, actual corrosion. But all these deleterious effects can be almost entirely avoided by proper treatment. It is true that, in several instances, Mr. Baker describes the necessary treatment, but he does not seem to explain its reasons so fully as they might have been explained; he is, apparently, much more preoccupied with describing constructional methods. Apart from this, however, the book is excellent.

Model Yacht Construction and Sailing. By Lt. Col. C. E. Bowden, A.I.Mech.E. (London: Percival Marshall and Co. Ltd.) Price 3s. 6d. net.

This is a remarkable little book that should be of interest and use, not only to those who build and sail model yachts, but also to those who are enthusiastic sailers of full-size craft of this kind. The author approaches his subject from a very unusual, if not unique angle, and provides his readers with a great deal of most useful information on how to obtain the best results. It is, perhaps, in the chapter dealing with airflow around sails and its effect upon the hull that Col. Bowden is most interesting; but the entire book, brief though it is, is thoroughly practical. The illustrations are clear and simple to understand; with them to help him, even the veriest novice should have no difficulty in grasping the meaning of the text.

Photographing Models. By John H. Al[illegible] (London: Percival Marshall and Co. Ltd.) Price 3s. od. net.

A really successful photograph of a model is not very easy to achieve, but here is a handbook which gives excellent advice on the subject. The most suitable type of camera to use, lenses, tripods and other equipment are fully explained; an entire chapter is devoted to the question of what exposure to give; the choice of subjects and how they should be lighted are carefully discussed, with the aid of excellent diagrams and illustrations reproduced from actual photographs by the author, and, finally, some sound instructions on developing and printing the negatives are included and should be of especial value to novices. We cordially recommend this book to all readers, but especially to those who essay the photographing of models at exhibitions.

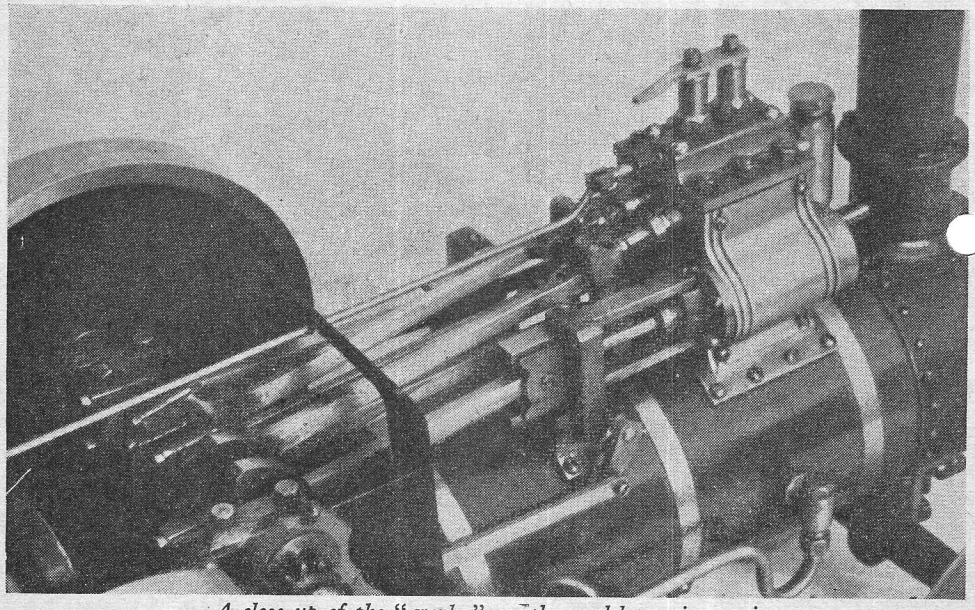


Sketch plans of the twin-cylinder unit as fitted to traction engine, showing method of taking live steam from boiler through bolting face of valve chest to starting and safety valves

ventional practice ; the boiler is of copper, coal fired, and is riveted and silver-soldered ; two feed-water tanks are fitted, one in tender and one in the belly tank under the boiler barrel with a compensating pipe connecting them. The engine is very flexible under steam and, of course, is self-starting in any position of the crank, owing to the 90-degrees crank-setting ; but one misses the distinct exhaust note that is a special charm (to some people, at least) of the single-cylinder job !

The 1½-in. scale semi-portable engine is to a design by Henry Greenly. Castings were obtained from Mr. Every, formerly of Elder Place, Brighton, who, I was very pleased to read in THE MODEL ENGINEER a few weeks back, is in business again. The cylinder on this model is 1 in. bore × 1½ in. stroke ; the boiler is of copper, coal-fi and is an excellent steamer.

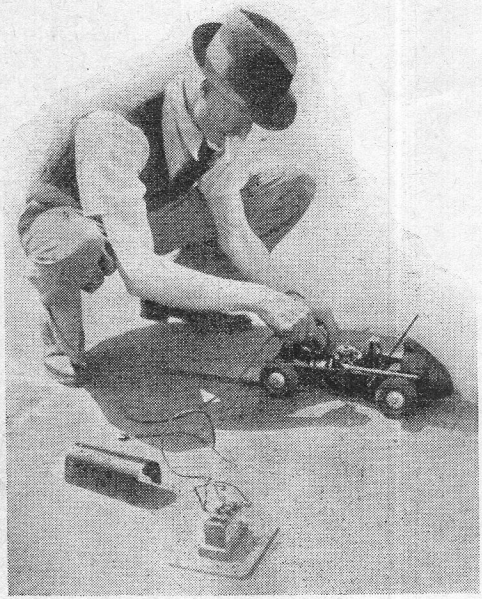
Several modifications to design as published were made. I did not, for instance, care for the very much off-set cylinder from top of boiler centre-line ; so the cylinder castings were sawn in half and the bottom portion (boiler saddle) machined at an angle. Afterwards, the two portions were screwed and sweated together again ; this enabled me to line the whole issue up on top of boiler with, I think, much improved appearance. My desire was to try to make it as much like the beautiful little MODEL ENGINEER overtype engine by A. J. Budd, which was described in 1912, I believe. Messrs. Bassett-Lowke used to market a very excellent set of castings for this model, but I believe it is now



A close-up of the "works" on the model traction engine

To Boost or not To Boost?

By
EDGAR T. WESTBURY



THE term "booster" is one for which you may search in vain in most English dictionaries, but it seems to have infiltrated very effectively into our vocabulary, presumably from the wild and woolly West, within recent years. To the locomotive engineer, it means a supplementary engine, often fitted in the tender, which can be called upon to assist the main engine under peak load conditions. The electrical engineer understands it as a specialised form of generator, which is introduced into transmission lines to compensate voltage losses; and to the aircraft engineer, it means a supercharging blower. To the user of model petrol engines, the term has come to be applied to a battery of large capacity which is temporarily switched into the ignition circuit to reinforce the "local" battery (usually of limited capacity) during starting and running-up. In all cases, the term clearly signifies some device or agency for furnishing that little extra urge which makes all the difference between efficiency and inefficiency under certain conditions.

A number of queries have been received from readers on the subject of booster batteries, in some cases raising the question of whether they are necessary or desirable, and in others discussing the best way to apply them. In the first place, it may be stated that, wherever possible, the battery used for ignition should be of ample capacity to supply all requirements under either starting or running conditions; in such cases, the booster battery becomes unnecessary and is, in fact, an undesirable encumbrance. Model power boat users, up to a few years ago, had never heard of a booster battery, but almost invariably used a small accumulator for ignition, which supplied all current requirements, with a safe margin in hand, provided that it was kept fully charged and in good condition. But in many applications of model petrol engines, particularly the smaller sizes of aircraft engines, every fraction of an ounce tells, and it becomes necessary to use the smallest and lightest battery which will serve normal running requirements; in such cases, the use of a booster battery for starting becomes either desirable or absolutely necessary.

As to the best way to apply the booster, this depends upon particular circumstances, and it is advisable to discuss the various ways in which it *can* be used on their individual merits. I have seen boosters connected in three different ways, and all have served their intended purpose more or less satisfactorily. In all cases it is usual to use some quick-connection device, such as a two-pin plug or a jack switch, to put the booster in circuit in order to save time in connecting and disconnecting it.

Fig. 1. shows the method which I used when I first made experiments with model petrol engines for aircraft propulsion. It entails not only the use of a two-pin plug but also a two-way switch, so that when using the booster the local battery is cut completely out of circuit. It is, of course, necessary to put the switch in the appropriate position for starting, and it must be changed over before removing the booster plug.

The arrangement shown in Fig. 2 is much more usual, and it has the advantage of dispensing with the need for a two-way switch; to bring the booster into action it is only necessary to insert the plug and, on the removal of the latter, the local battery takes over. An ignition switch of some kind, however, is usually a necessary fitment, if only to protect the local battery against discharge through closed contacts when the engine is stopped; and a two-way switch need not be perceptibly heavier or bulkier than one of the single-throw type. It is necessary to ensure that the booster battery, when connected in this way, is of the same polarity as the local battery, or the two will work in opposition, and the smaller battery may be run down or damaged thereby. A plug with pins of unequal sizes or other special form of construction may be used to ensure that the battery is properly connected, but many users rely upon a marked plug for this purpose.

It is sometimes believed that the best way to ensure easy starting is to apply increased voltage to the ignition circuit, and I have seen the arrangement shown in Fig. 3 advocated by an alleged authority on the subject. In this circuit

an efficient spark at speeds which are easily obtained with normal starting gear.

An even stronger reason against the use of a booster battery with a magneto is that when current is applied to the exciting coil or armature, other than that self-generated by its own rotation, there is a risk that the magnet may become partially de-magnetised, and its efficiency thereby become permanently impaired.

The booster battery can only be used on single-cylinder magnetos, as these always work on unidirectional current, when the usual policy of keeping the primary circuit open during the idle half-wave is adopted. In a twin-spark magneto the current surges in the two half-waves are of alternate polarity, and thus, on one of them, the battery current would oppose the self-generated current, and weaken the spark instead of strengthening it. A booster battery could not be used on such a magneto unless it was fitted with some more or less elaborate means of commutating the current, so that it would always reinforce that generated by the magneto itself.

If, however, readers should decide to use a booster battery in connection with a magneto, the best way to apply it is by means of a series jack plug interposed in the lead between the armature coil and the contact-breaker. This jack should be of the type which, on insertion, separates two normally closed contacts and puts them in series with the battery circuit; it must, moreover, always establish the correct polarity. In view of the importance of keeping down the resistance of the magneto primary circuit, the "short-circuit" contacts must be robust, and press firmly together when the jack is removed.

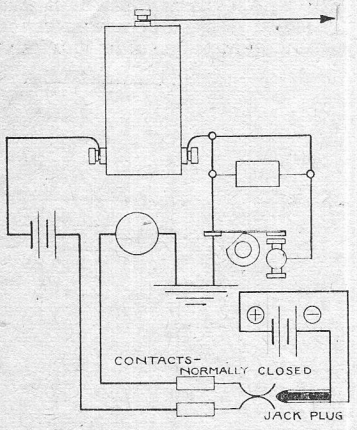


Fig. 3. Booster battery connected in series, by means of a jack plug

More Castings and Parts

Mr. W. H. Haselgrove, of 1, Queensway, Petts Wood, Kent, has submitted for my inspection a complete set of castings for the "Atom V" 30-c.c. racing two-stroke, consisting of 23 pieces, in aluminium alloy, cast iron and bronze. These are all cleanly formed and sound, in metal which machines well, and they conform with the requirements of the design. It may be mentioned that there are now many "Atom V" engines in service, and reports received about them are in nearly all cases very favourable; some of them have already performed very efficiently in speed boats. Mr. Haselgrove also supplies excellent castings for THE MODEL ENGINEER Road Roller, the "1831" locomotive, and the "Atom" Type R carburettor for either 15-c.c. or 30-c.c. engines.

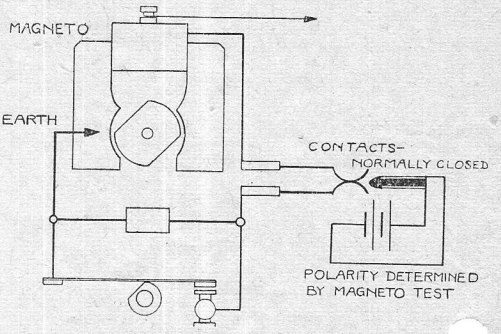


Fig. 4. Showing how a booster battery may be applied to the primary winding of a magneto

Sets of die castings are now available for the "Kestrel" 5-c.c. engine, which is still as popular as ever, having found a new lease of life by reason of its suitability for model racing car propulsion. These castings are produced by Mr. L. D. Johnson, of 2, Rowan Way, Northfield, Birmingham, and the sample set which I have inspected are very sound, clean and accurate; their superiority over sand castings of the average quality is beyond question.

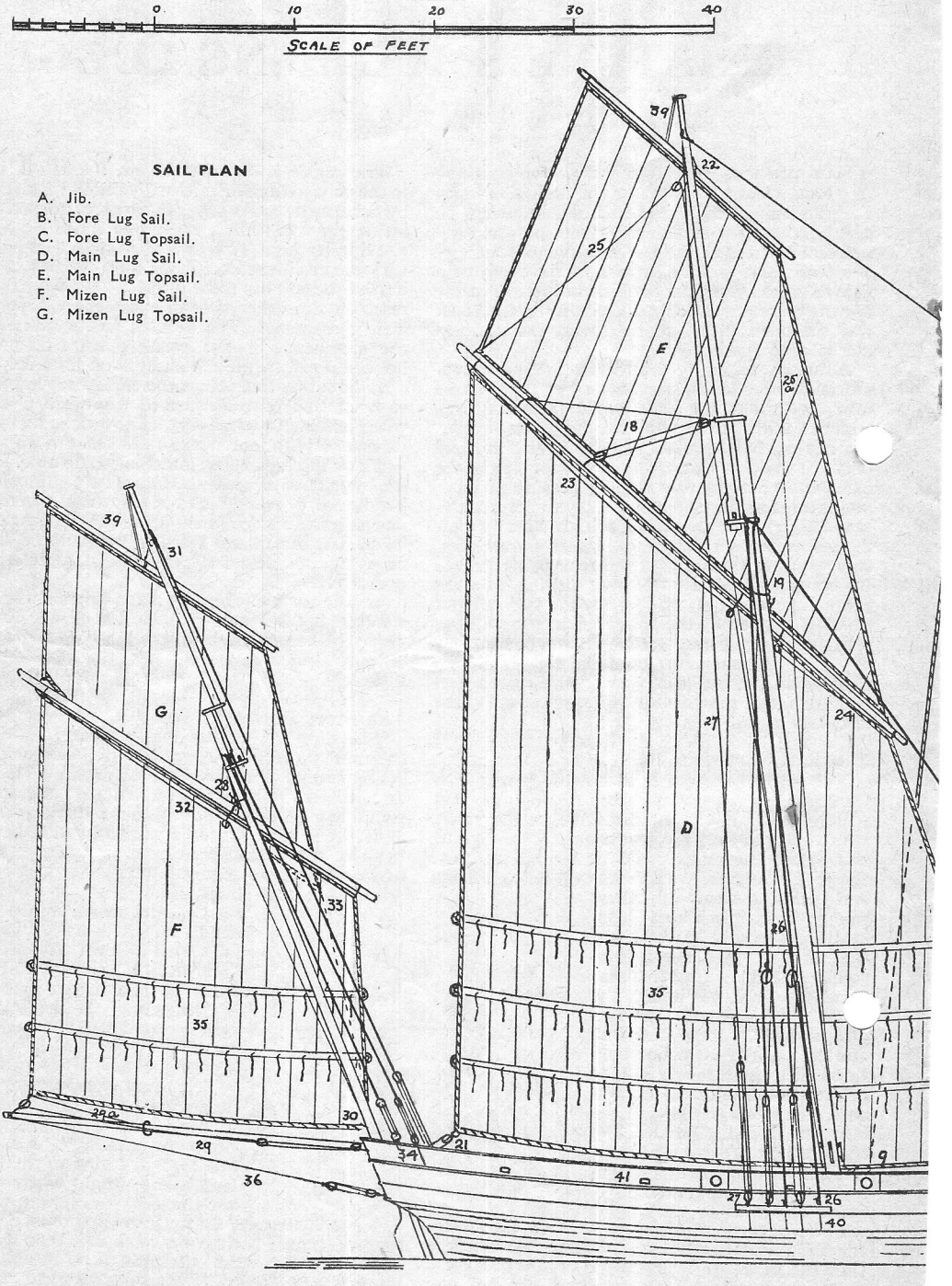
I would like to take this opportunity of reminding readers of the risks in buying castings and parts for engines or components alleged to be in accordance with MODEL ENGINEER designs from unauthorised suppliers. Several complaints have been received lately from readers who have encountered unsatisfactory goods or service in this respect, and the obvious way of avoiding this is to deal only with those traders whose goods have been examined and approved in these pages. While it is obviously impossible for me to publish a denunciation of those traders who have been found wanting, I can and will take every opportunity of bringing to the notice of readers anything submitted to me which I consider sound and worth buying.

Hair-splitters' Happy Hunting Ground

I have always been dead against loose terminology in technical matters, and have often raised my voice in criticism of writers who use vague or incorrect terms in technical articles. There is, however, a vast difference between concise definition and the splitting of hairs on the exact spelling and pronunciation of words, or even the more highbrow *nuances* of grammar. A technical writer is not expected to be an expert on language or literature, but he should be able to give a lucid and exact description of matters within his sphere of operations.

Some years ago readers of THE MODEL ENGINEER witnessed a violent "storm in a teacup," in which the teaspoon figured as the centre of controversy; in other words, an

(*Continued on page* 537)



SAIL PLAN

Armed lugger, circa 1775. Length 60 ft.

yard and sail close to the mast to prevent loss of power.

In its simplest form the yard is hoisted by a tye—a well-greased rope is passed through the eye on an iron traveller, called a parrel, which slides on the mast and hooks to a strop on yard about one-third from throat (Fig. 1). The tye passes through a dumb sheave about 18 in. from top of mast and has a tackle clapped on (either a gun or luff purchase) through which the halyards reeve, and always set up on the weather side they serve as backstays. A burton purchase was usually hooked a couple of feet or so abaft the halyards and also shifted over every tack. Peak halyards and standing rigging were never used except in the big armed luggers, which had shrouds or runner tackles.

The Favourite Rig

From about 1770 until the 1850s the three-masted lugger was the favourite rig, and the general size was about 40 ft. long and 12 to 13 ft. beam. Hulls were clench-built, with bold sheer and very fine lined below water. Ready for sea they cost from £300 to £500. The foremast was stepped right up in the eyes, about 4 ft. from stem, and mizen against transom, with the main mast made to lower. Eventually this mast was dispensed with and fore and mizen retained, with larger sails and mizen mast stepped more inboard. The reason vouchsafed for this change was that the main mast got in the way of the nets while fishing. It is rather curious that this discovery (?) was only made after about seventy years' use and coincides with the decline of smuggling and the need for getting the utmost speed out of a boat! The popular rig was now a dipping lug on fore and a standing lug on mizen, sheeted to long outrigger, with a jib sometimes set on a reeving bowsprit. Generally speaking, save for local characteristics and better-cut sails, this rig now remained practically unchanged until the coming of the marine motor—the *infernal* combustion engine, which rapidly swept the picturesque fishing fleets out of existence.

In the smaller luggers the sheet was never made fast, but had a couple of turns round the samson post, where the old main mast had been stepped, and was held in the hand, being eased out in heavy puffs or squalls and taken in again—in open boats the lives of all on board depended on the skill of the man at the main sheet. The mizen having a standing lug was usually set to port, the halyards going to starboard and the burton to port.

Up to the 1870s the lug was the rig of North Sea fishermen from Yarmouth and Lowestoft; with the tendency to increased size the time came when the lug became unmanageable—not being suitable for trawling, many boats converted to ketch rig, whilst the luggers went in for drift fishing, for which they were eminently suited, as with lowered foremasts they rode easily to their nets. Yet, strangely enough, the Isle of Man fleets converted from cutter and ketch to lug rig, being convinced of its superiority from contact with Cornish fisherman, who never favoured either of the other rigs, while Brixham swore by them.

The Scotch luggers ran very big, up to 80 ft. in length, carrying enormous dipping lugs on foremast, up to 70 ft. in height, with 7 or 8 lines of reef points and no standing rigging. Truly an awe-inspiring sail to handle in a freshening breeze, needing all hands out on the weather rail tailing on the sheet as boat smoked along at over 10 knots.

Best known of all were the wonderful Deal luggers—open boats except for a short deck forward and manned by crew of about 7 men and a boy. In the days of hemp cables their services were always in demand for taking out new ground tackle to ships riding in the Downs. It is amazing how men were able to launch an open boat off the steep shingle beach into a howling winter gale, with an anchor and cable weighing anything up to 7 tons inside thin planking, beat to windward and get the heavy gear safe on board a distressed ship plunging bows under and rolling madly. Magnificent seamen—they thought nothing of cruising down Channel for a fortnight in an open boat in midwinter in the hope of picking up a worthwhile job. Yet their unrivalled services often brought miserable rewards—in 1862 J. Williams was put aboard the *Royal Charlie* to pilot her down Channel; the wind being [illegible] the captain refused to stop off the Isle of Wight to put him ashore and carried him 300 miles from the Channel before he met a schooner homeward bound. He then handed the pilot £2. The latter was landed at Liverpool and had to pay his own rail fare back to Deal after an absence of many weeks. Sometimes a pilot was taken on to Australia and was six months away from home.

Thing of the Past

Today, when sail has completely vanished from the seas, it is difficult to picture the Downs crowded with sailing ships, during the first four days of April, 1858, no less than 220 sailing vessels left the anchorage and only 5 steamers, while a spell of S.W. winds would see anything between 450 and 500 vessels sheltering. During the great gale of March 12th, 1876, there were 19 collisions, 4 ships driven ashore, 48 lost anchors and chains, and yet not a single accident to the luggers supplying fresh ground tackle. In normal weather the charge for this service was £1 a cwt. and 10s. to 15s. a cwt. for cable, but when it was a question of salvage awards varied according to risks run. In 1871 lugger *Lord Paget* received £150 for supplying gear to a Swedish ship, while in 1876 no less than £700 was awarded to *Seaman's Hope* for putting two anchors and c[illegible]s aboard the American ship *Kendrick Fish*.

On the other hand, it is difficult to find words to describe the action of the Board of Trade, who gave the munificent sum of £2 to the crew of the *Mexborough* for saving the lives of 11 men from the French vessel *Ingolf*, which worked out at less than 3s. for each member of the crew. Or to realise the meanness of the captain of the East Indiaman *Earl of Eglinton* in January, 1860, who refused to accept the offer of a Deal boatman to pilot as far as the Isle of Wight for £8. The ship was totally wrecked a few hours after sailing and over £100,000 of Government stores were salved, chiefly by local boatmen, while the wreck was sold for £150.

The big armed luggers mounted 8 to 14 guns, and usually set lug topsails—a striking feature was the stepping of the topmast abaft the mast on

"L.B.S.C."

"Hielan' Lassie's" Smokebox Tube-plate

AS we shall need the smokebox tubeplate to act as support and spacer when silver-soldering the tubes into the combustion-chamber tubeplate, this will be the next job. A circular former is needed, $4\frac{3}{16}$ in. diameter; although the thickness of both the boiler barrel and the tubeplate is 3/32 in., or 13-gauge. the tubeplate, when flanged, should be slightly larger in diameter than the inside of the barrel, so that it can be turned to a tight fit in same. It is seldom that I have to make a special former for a smokebox tubeplate, as I can usually find an old chuck-plate casting, wheel, or something else of requisite diameter. Cut out a circle of 13-gauge sheet copper to a diameter of approximately $4\frac{3}{4}$ in., soften it, and flange over the former as previously described. You probably won't be able to get it on to the inside jaws of your self-centring chuck for turning the flange, as the bottom steps of the jaws will be in the way; so put the outside jaws in, grip the flanged plate with the flange outwards, and skim off any raggedness left by the flanging operation. Then reverse the plate, and mount it on the outside of the top step of the outside jaws, gripping by the inside of the flange; this may sound like Pat O'Finnigan's way of chucking it, begorra, but it will be found quite O.K. Turn down the outside of the flange with a round-nose tool, and don't forget a drop of cutting oil; make it a tight fit in the barrel, but not an actual drive fit, or you may damage the smokebox end of the nest of tubes when fitting the tubeplate to the barrel.

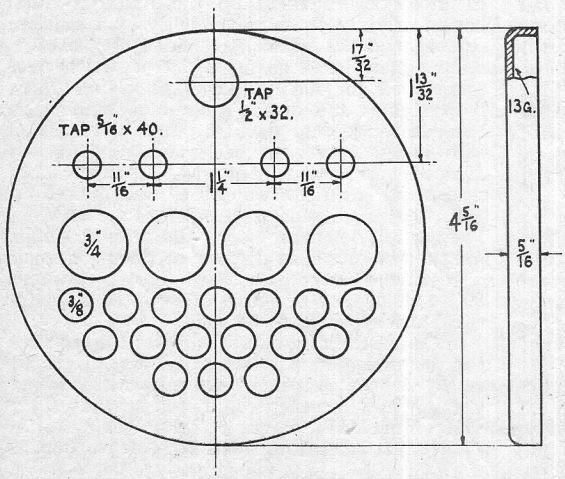
Use the combustion-chamber tube-plate former as a jig for setting out the holes for the tubes. Simply clamp the former to the tubeplate by aid of a toolmakers' cramp, with the semi-circular edge of the former about $\frac{1}{4}$ in. or so from the flange of the tubeplate, so that the tubes will be about horizontal. Billy Stroudley used to slope his tubes upward towards the smokebox, and camber them slightly as well, to avoid leakage caused by expansion. The tubes and the boiler had different degrees of expansion. We needn't bother about this on an engine of $3\frac{1}{2}$-in. gauge, with the whole boiler and tubes made from the same kind of metal, as the whole bag of tricks expands as one unit.

Poke the No. 40 drill through all the holes in the former, carrying on right through the tube-plate; then remove, and open out all the holes exactly as described for the combustion-chamber tubeplate, but push the reamer well through each hole, so that the tubes will fit easily this end, and in addition, countersink the holes slightly on *both* sides. This is to allow on one side for easy entry of the tubes when assembling, and on the other side, a little trough to fill with silver-solder, and make a perfect job.

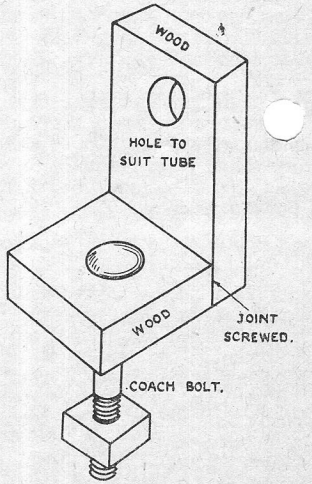
The holes for the steam-pipe, and the longitudinal stays (both solid and hollow) are shown in the accompanying illustration, and need no detailing. Be careful, however, to run the tap through square with the surface when tapping, and recollect that a drop of cutting oil on the tap makes easy work of it.

Tubes

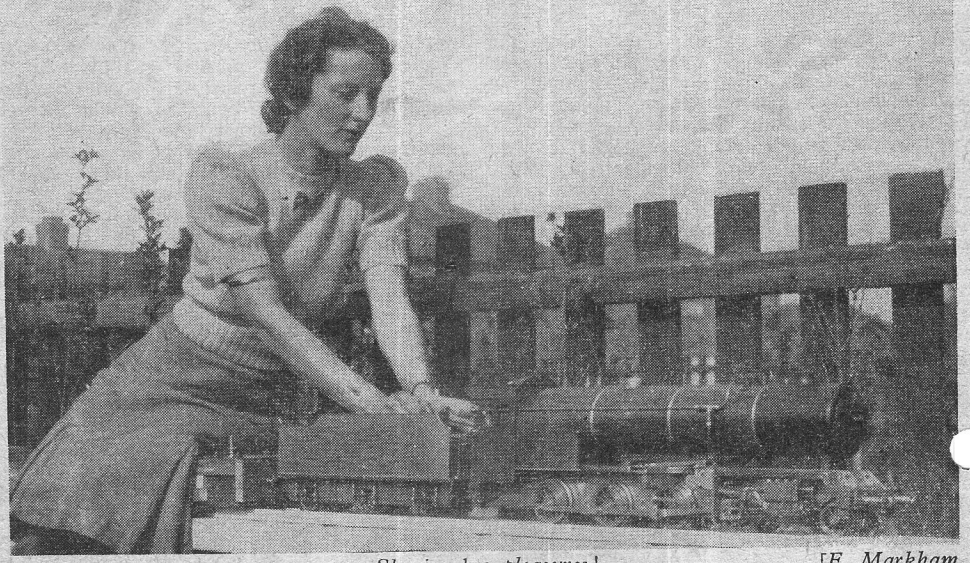
Readers who know of my experiments with boiler tubes may be surprised to notice that the diameter of the small tubes is $\frac{5}{8}$ in., as I quoted 11 in. for the maximum efficient length of this diameter; but one explanation is that they are not fitted direct in the firebox, but the combustion chamber intervenes. Had the engine been an Atlantic or 4-6-0 with a shorter barrel and no combustion chamber, the tube diameter would have been $\frac{7}{16}$ in. I needn't go into the whys and wherefores here, but I might just whisper into



Smokebox tube-plate for "Hielan' Lassie"



Steady for turning tube ends



[Photo by] *Sharing* his *pleasures*! [*F. Markham*

cooling to black, carefully take off the smokebox tubeplate, and make the ends of all the tubes and flues dull red. It doesn't matter whether these cool to black or not, before quenching in the pickle; the object is first to soften them so that they may be properly expanded into the smokebox tubeplate, and secondly to ensure a properly clean surface for silver-soldering. Next week, all being well, I'll tell you how the whole issue is assembled and fixed in the boiler shell. Meantime, here is a tip that I forgot to mention when describing the brazing up of the throat-plate. Easy-running strip, when melted, has not the fluidity of melted silver-solder; and when going around the semi-circular joint between barrel and wrapper, it may happen that the easy-running strip will just fill up the crack between the plates, and not penetrate to the butt strip which is riveted inside. If you run some silver-solder—coarse grade will do—into the crack first of all, this will penetrate and make a sort of inside seal between the plates and the butt strip. something like soft solder does when sweated in with a blowlamp. The crack can then be filled up with the molten strip, after you have run in the fillet under the barrel, and if any superfluous knobs and excrescences show above the crack, just file them flush. This precaution is not necessary if Sifbronze is used with an oxy-acetylene blowpipe; all there is to be done in that case, is to fill up the V-groove (which I mentioned should be filed around the joint) by the drop-by-drop method as given in previous instructions. This makes the joint stronger than the plates themselves; and the "ripple" need not be filed off, as it will be covered over by the lagging.

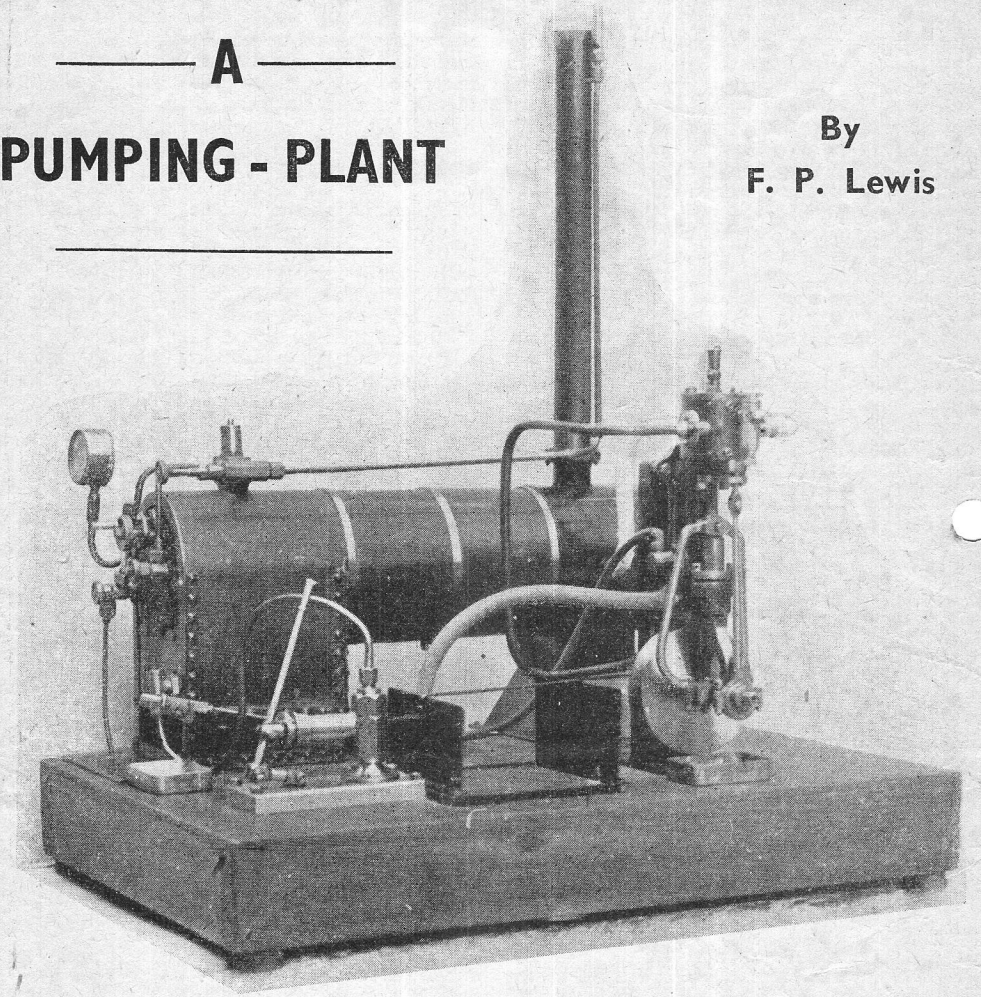
The "Old Firm" Still in Business!

What with the opening of the Malden club's new railway, and the active construction now in progress, by the Birmingham S.M.E., a Campbell Green, of a line approximately 1,020 ft around, plus others either under way or contemplated, we are inclined to forget the pioneer of them all, the open-air club track at Romford. Though this will soon be transferred to a new site, as the present one is required for other purposes, at the time of writing it is still in active service; and I am in frequent communication with various members who are certainly not failing in their enthusiasm for the little iron horse. The genial and energetic secretary himself is building a hefty job in 3½-in. gauge, to wit, a L.M.S. 2-6-4 tank engine, and is fortunate in possessing a wife who is just as keen on locomotives as he is. Mrs. Constance Markham is a skilful driver—here you see her on the job—and she sends a personal message to all other wives of locomotive builders, viz., "Try to take an active interest in your husband's hobby, or at least show tolerance, understanding, and helpfulness, whether by thought or action. Harmony in *his* world of little engines, is the best guarantee of happiness in *your* home." With those sentiments your humble servant heartily agrees.

I mentioned in a recent note that the "official" speed record of just over 10 m.p.h. was held by Mr. S. H. Carr's "Fayette," but the track manager, Arthur Chapman, says the same builder's "Mary Ann" (J.39 L.N.E.R. 0-6-0) equalled that speed when competing in the Henderson trials at Romford, in 1939. She was hauling Stan Carr himself, plus a load of lead weights. This is some going for an 0-6-0 goods engine, and just goes to show what can be done by early admission and free exhaust. The engine was built to the instructions given in these notes a long time ago; I built the original engine of the series, from which all the dimensions were taken, and she is still in existence at

A PUMPING-PLANT

By F. P. Lewis



THE photograph shows a recently-completed model pumping plant that I have made. Built to a scale of $\frac{3}{4}$ in. to 1 ft., the model represents a steam pumping plant used for pumping tanning fluid in a chamois leather works. The prototype was working during the war, until one of the Fuhrer's bombs badly damaged the factory.

The pump is of the Tangye wall-type in which the steam and pump cylinders are in line and are cast in one piece with the back plate which also includes pump valve boxes and extends to form the bearing blocks for the crankshaft—a very intricate piece of casting work. The back plate is designed to bolt on to a wall or like support. In the case of the leather works installation, a strong piece of steel girder formed this support, space being restricted. In the model, steam cylinder is $\frac{3}{4}$ in. bore × 1 in. stroke, and ram diameter $\frac{3}{8}$ in. lide-valve on steam cylinder is actuated by the usual fixed eccentric and slide-valve. Boiler is a coal-fired locomotive-type, $12\frac{1}{2}$ in. overall length and 3-in. barrel diameter. Working pressure 55 lb.

In the full-scale plant the "beer cellar" flaps give access to a large underground tank protected by a steel grating; in the model, the base incorporates this tank. Fluid is pumped up *via* this grated opening through the large suction hose and delivers *via* a smaller section hose, passing under boiler barrel, to various vats. The very large hand-pump serves a dual purpose. Used normally for boiler feeding, in emergency an ingenious system of valves enables it to be used for pumping fluid from the large underground tank. The factory "knocking on and off" whistle was fixed to the tall and slender chimney and can be seen in the photograph.

The pump is rather fascinating to watch in action under load, its speed being slow enough to view the moving parts clearly without the usual speed blur. At a boiler pressure of 40 lb., a jet 9 ft high is thrown from an $\frac{1}{8}$-in. delivery-nozzle. Running light, *i.e.* with the suction hose removed, the engine revs. like an aero unit; but, due to the "in line design," is absolutely vibrationless and silent. The model occupied some 22 months of spare time construction work.

A British museum offered him his own price for it, but maker refused to sell."

This statement set me thinking. If British museums are interested in a model by a Viennese craftsman, perhaps they would be equally interested in one made by little me.

Then came the first headache. "Real Strads" are not exactly things to lend even if you know anyone who is the fortunate possessor of one, and I didn't even know of one in Staffordshire, so I was stumped for the time being, until I quite casually mentioned it to "one of our travellers." Oh, yes. I forgot to mention that I'm a one man grocer by trade (a biter off of B.Us.). This traveller was the proud owner of a genuine Strad, and not only that, he was willing to lend it to me, and so the job started. 400 hours on a model which weighs only 1/25 of an ounce, and is *under two inches long*.

The violin is made chiefly of boxwood, which is ideal for really small woodwork, as it is practically grainless and will turn, carve and polish well.

The body is built up exactly like the real thing only from a smaller number of pieces. Back, belly, ribs, etc., all being separate pieces glued together. A sound post is fitted inside though more to give strength rather than tone.

The back and belly both have an inlaid line about 1/100 in. wide running all round. This, I think, is called "purfling" by those who make the real full-sized articles.

The pegs also put a severe strain on my stock of Aspirins, as I made and spoiled twenty before I got four good ones. They taper down from 1/32 in. and have a hole through approximately 0.005 in. diameter.

The "strings" are of two kinds. The three thickest are very fine yellow silk and the finest is of gold wire 0.001 in. diameter.

The bow is a comparatively straightforward job, again using fine silk instead of the horsehair which is used on the full-sized job. Bow weighs 1/200 of an ounce.

The case is made of thin metal with fibre carrying handle and two small snap fasteners. It is enamelled black outside and is lined inside with the finest green silk I could get. A small compartment with hinged lid contains a microscopic piece of resin. This little job was completed on September 3rd, 1939, the day the last war started.

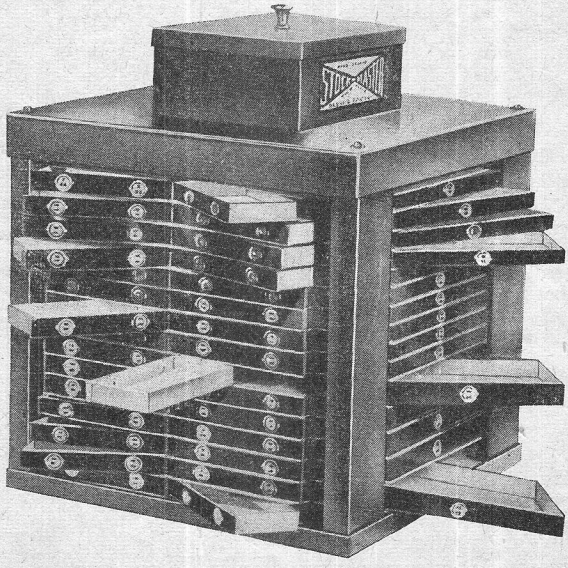
Though the museum which was so interested in Mr. Ostrizek's violin is unknown to me, I often wonder if they would show the same interest in one made by an Englishman.

I am a member of our rapidly growing North Staffs. Models Society, and hope to show my little effort at our next exhibition.

A MULTI-PURPOSE REVOLVING CABINET

READERS who delight in a tidy and orderly workshop can hardly fail to be highly intrigued by the cabinet illustrated on this page, which has been introduced by Messrs. S.Guitermann &Co. Ltd., of Amersham, Bucks. This solves once and for all the problem of storing small tools, such as drills, taps, reamers and cutters or screws and other small components used in model engineering assembly.

The cabinet is made of heavy gauge sheet steel, and is mounted on a solid turntable base, which is heavy enough to avoid the risk of tilting if the load is out of centre. Metal indicating tabs are fitted to all drawers, which are 90 in number, 60 being half the frontal width and 30 the full width, and they are pivoted to swing out from one corner. The top well of the cabinet has a push-on cover, and is fitted with honeycomb partitions to take drills up to ⅜ in. diameter.



The "Stockmaster" revolving tool cabinet

Overall dimensions of the cabinet are as follows: Height 16 in., width 12 in., depth 12 in. Large full length drawers 6¾ in., small half-length drawers 4½ in. Base 7¾ in. diameter. Total weight, empty, 56 lb. The framework is finished in olive green stoved enamel, with black enamelled drawer facings, and the inside of drawers and honeycomb framework is cadmium finished. In view of the space limitations of most model workshops, and the ever-expanding problem of finding "a place for everything," this cabinet should have a wide appeal.

quarters to house the books. Meanwhile, I think it would be a good thing to prepare a register of books and blue-prints belonging to members who would be willing to lend them on occasions to other members. A little job for our secretary unless we appoint a librarian for that purpose."

A MEMBER: "Are we going to accept boy members?"

CHAIRMAN: "I suggest not at present. We should have a minimum age of, say, 16—perhaps later on we might form a junior section. I think we should encourage young model makers as far as possible, and might possibly arrange a special 'juniors' evening,' when there could be a show of junior work with, perhaps, some small prizes. The boys of to-day will become the members of tomorrow."

A MEMBER: "Can we have our own 'live steam' locomotive track?"

CHAIRMAN: "That is something we should work for, either a portable indoor track which can be erected as and when required, or a permanent track outdoors, if we can arrange a suitable site. The portable track could be taken to outdoor fêtes to give a show in aid of local charities. Those members who are fortunate enough to possess a garden track of their own might give other members facilities for an occasional run, or perhaps arrange a 'live steam' meeting of the Society now and again."

A MEMBER: "Can any member help me with a machining job? My own lathe is not heavy enough to turn some castings I have in hand."

ANOTHER MEMBER: "I can fix that, Mr. Chairman. I have a power-driven 6-in. lathe, a shaper and a miller, and shall be glad to help any member with machining jobs."

CHAIRMAN: "That's splendid, Mr. ——. Just the sort of mutual help we require."

A MEMBER: "Another S.O.S., Mr. Chairman. I have a 5-in. gauge locomotive which I should like to bring along to a meeting, but it's a bit heavy to carry. Any offers of transport?"

ANOTHER MEMBER: "I could bring a 6-ft. model of the *Queen Mary*, but I can't carry it under my arm."

CHAIRMAN: "There's a chance for car owners to help. Any offers of occasional transport for meetings will be very welcome."

A MEMBER: "What will the subscription be?"

CHAIRMAN: "We shall keep it as small as possible, to suit everybody's pocket, but we must, of course, pay our way. The provisional Committee will consider our working costs very carefully and make a suggestion at our next meeting. We are not out to make money except for purposes which will be of benefit to all the members."

A MEMBER: "Have we any interesting visits in prospect?"

CHAIRMAN: "Yes, I hope we shall be able to arrange some outings of this kind. If any member has influence with places or works of engineering interest in the neighbourhood we should appreciate his help in making plans. Any more questions? No? Well, that concludes our formal business this evening. Don't hurry away, but let us gather round for a little while to look at the models on show, and make each other's acquaintance. Don't forget, before you go, to leave your name and address with the Secretary.

A MEMBER: "I move a hearty vote of thanks to our Chairman and Secretary." (Applause.)

CHAIRMAN: "Thank you, Mr. ——. It is not really necessary, for we all want to help. I am sure we are going to have a very happy Society."

Clubs

The Society of Model and Experimental Engineers

A rummage sale will be held at the workshop on Saturday, November 30th, at 2.30 p.m, Attendance at this sale is limited to members and affiliated members.

The annual general meeting will be held at 39, Victoria Street, Westminster, S.W.1, on the following Saturday, December 7th, at 2.30 p.m. This is always the most important meeting of the year and members should make a special point of attending. This is the occasion for suggestions to be put forward and complaints aired.

Secretary: J. J. PACEY, 69, Chandos Avenue, Whetstone, N.20.

South London Model Engineering Society

A visit has been arranged for Wednesday, December 4th, to the locomotive and carriage works of the Southern Railway, at Eastleigh.

Those members who wish to join the party should give their names in to the secretary.

At the meeting for December 29th, at Dog Kennel Hill, starting at 11 a.m., there will be a talk by Mr. T. Rowland, on "Boat Engines." Particulars of the society and membership details can be obtained from the Hon. Secretary: W. R. COOK, 103, Engleheart Road, Catford.

Burnley and District Society of Model Engineers

The next meeting will be held on Friday, November 29th, at 7.30 p.m., in the Church Institute, Manchester Road, Burnley.

Joint Hon. Secretaries: A. BATEY, 36, Moseley Road, Burnley, Lancs.; and J. D. MEE, 2, Windsor Avenue, Church, near Accrington, Lancs.

Eltham and District Locomotive Soc[illegible]

The next meeting will be held at Burn[illegible]sh School, Kaugefield Road, Bramley, the Society's new headquarters, at 7.30 p.m., on Thursday, December 5th, when Mr. A. Hutton will give a talk on "The theory of valve gears."

Mr. Hutton, being a highly skilled engineer, this should prove a very interesting evening. Visitors are cordially welcomed, and anyone interested in running and constructing small power locomotives should apply to the secretary for application form for membership.

Hon. Secretary: FREDK. H. BRADFORD, 19. South Park Crescent, Catford, S.E.6.

Mancunian Model Engineering Society

Members had a very interesting evening on Monday, November 4th, when they paid a visit to the L.M.S. School of Signalling, at

"THE MODEL ENGINEER"

SALES AND WANTS

Private: **Threepence** *word. Trade*: **Sixpence** *word. Use of Box* **2/6** *extra. Minimum charge,* **3/-**

TOOLS & WORKSHOP

Buck and Ryan's Department for Lathes, Drilling Machines, Grinders, Electric Tools, Chucks, Surface Plates, Lathe Accessories and Tools.—310-312, Euston Road, London, N.W.1. Telephone: EUSton 4661. Hours of Business: 8.30 to 5.0 p.m., Monday to Friday; Saturday, 1.0 p.m.

Split Chucks for Watchmakers' Lathes, 6 mm., 6½ mm., and 8 mm., at 7s. each, postage 6d.—JOHN MORRIS, 64, Clerkenwell Road, London E.C.1.

Infinitely Variable Speed Gear, ratio 16 : 1 material supplied, leaflets—CROWTHER, 85, Charlotte St., Rochdale.

"Little John" Lathes. Sole Selling Agents for Home and Export. Send for illustrated literature and orders to—THE ACORN MACHINE TOOL Co. (1936) LTD., 610/614, High Road, Chiswick, London, W.4. Telephone: CHIswick 3416-7-8-9.

Model Engineers! ¼" Taps, 48, 40, 32 t.p.i., carbon, 1s. each; H.S. 1s. 4d., post paid. Stamp, list other sizes.—41, Forest Road, Southport.

"Crown" 4" Independent Chucks, 42s.; Twist Drill Grinding Jigs to ½", 16s.; Tailstock Dieholders, take 13/16" and 1" Dies, No. 1 M.T., 25s.; Abrafiles, 9d.; Links, 4½d. set; Davies Minor Saw Frame, 1s. 3d.; Blades, 6", 6d. Booking orders for following Lathes: Myford ML7 3½", M type 3½", 70 weeks delivery; "Little John," 5", £115, 26 weeks; Atlas, 5", £82 10s., 8 weeks; Coronet Diamond, 2¼", £27 17s. 6d.; Coronet Jewel, 1½", £18 15s.; Coronet Woodworkers, 3⅜", £7 12s. 6d.; extra Saw Table, etc., model, £10 18s. 3d., above 12 weeks. Prices ruling at dispatch time. Note can only supply post orders from this advertisement. This gives all equal chance. Cash returned without question if not suitable on receiving, post paid over 5s. Sign cheques, S. Grimshaw.—S. GRIMSHAW, Dept. A, 7, Hall Street, Gorton, Manchester 18. (Warehouse), Gorton Lane, Gorton.

3¾" Heavy Duty Plain Lathe, 30" centres, really massive construction, hand-scraped steel bed and slides, 4-tool turret, No. 2 M.T. headstock, bronze bearings, faceplate, chuck backs, etc., £57 10s.—"Atwood," Prince Avenue, Southend-on-Sea, Essex.

Wanted, Stuart Turner No. 3 Vertical Compound Steam Engine, 1½" and 3" bore.—Box No. 4218, MODEL ENGINEER Offices.

For Sale, surplus to requirements, one Parkinson and one Tangye Vertical Milling Machines, price £140 and £200; one Colchester "Bantam" Lathe, motorised, £125, wired single phase A.C.; also one Atkins Process Lathe, motorised, single phase A.C., £45. Full information—AUSWAL SMALL TOOLS, 191, London Road, Kingston. Kingston 7610.

Wanted, Adept No. 2 Shaper or similar, in good condition.—ARMSTRONG, Harford House, Stogursey, Nr. Bridgwater.

Circular Rotating Milling Table, fully graduated in degrees, £10.—GREenwich 2220.

Wanted, 27T. Gear for Tailstock End of old type 3½" Drummond.—TOMKINS, 45B, The Avenue, Surbiton, Surrey.

End Mills, 1/32", 3/16", ¼", 1s. 3d. each; 5/16", ⅜", 7/16", ½", 1s. 9d. each. Post 6d.—H., 80, Ridgeview Road, London, N.20.

Wanted, Super Adept or other small lathe with accessories. Particulars to—LINSELL, 25, Egerton Gardens, Ealing, W.13.

Two Atmospheric Pressure Gauges, 300 lb., 3" diameter (Budenborg), new, £4 10s. or near offer. Apply—DAVIS, 176, Westbourne Grove, W.11.

Lathe Wanted, S.S. and S.C., about 4" or 5", new condition essential.—GREIG, South Zeal, Devon.

Sale, Small Ball Races, ideal for model work, ⅛" O.D., 1/16" bore, 5/32" wide. All model engineers will find these useful at 1s. each, or 10s. per doz., postage 3d. per order.—A. JONES, 375, Purley Way, Croydon.

Wanted, Saw Bench, 12", new or second-hand, motorised, 230 v. A.C.—CUTBILL, Danebury, Leatherhead.

Lathe Wanted, 3" to 4½" B.G.S.C., good condition, any drive.—1, Leys Road, Cambridge.

Myford Vertical Slide, Swivelling type, new, unused, 65s.; wanted, larger vertical slide, suitable Milnes 3¾"—MASSEY, Baldwins Gate, Stoke-on-Trent.

2½" S.C.B.G. Bench Lathe. All steel construction, slotted table, full compound rest, set over tailstock, milling attachment, indexing head, 4-jaw independent chuck, ½" drill chuck, £25; 4" "Maco" adjustable template, 25s.; "John Bull" Dial Micrometer Set in plush case, £5; 9" quick release Woodworking Vice, £2.—STEVENS, 21, Archers Road, Southampton.

Lathe Wanted, 2⅛" to 2½", and accessories, full particulars.—BEAN, 62A, Kimbolton Road, Bedford.

Myford 3½" Lathe, "M" type, complete with bench, motor unit, and ½ h.p. 230/1/50 motor. Ex stock. List price, plus carriage. Accessories and spares for Myford, Drummond, Atlas, and Adept Lathes. All model engineers' supplies.—TERRY, Fishers Lane, Cold Ash, Newbury.

Wanted, Maker's Instruction Manual for 4" Round Bed Drummond Lathe, very good price paid.—GUNTER, 27, Oakhill Road, Horsham.

Surplus Machinery. Lathes: I.X.L. 8", £115; American Tool 9" × 4' 6", £125; Cincinatti 8", £110; Ace Monoturn, £55; Pittler 5", £45; Atlas 5", £72; Excel Precision, £50; Seneca 7", £60; Colchester Triumph, 6½", £105; Holbrook 5", £78; 40 others. Also 40 Capstans, including Ward, Herbert, Exacta, Swisten, Atlas, Morey. 30 Drills, Surface Grinders, Hacksaws, Compressor Plants and Units, 80 Electric Motors, 30 Milling Machines, Plain, Universal and Vertical. 20 Flypresses, Gas Muffle. Stationary Engines, etc. Complete list free. Seen any time (appointment week-ends).—VICTA ENGINEERING Co., Maidenhead. 'Phone 50.

MODELS & FITTINGS

Blue Prints of problems by return post. Latest super detail prints are Clipper "Stonehouse," 16s.; Racing Yacht, 14s.; Liner "Stirling Castle," 12s.; Destroyer "Coassck," Tug or Motor Yacht, 8s.; Centre Flue Boiler, 3s. 6d.; Blowlamp, 3s. Enquiries 2½d. stamp.—WILSON, MACDUFF & Co. LTD., 5, Victoria Street, London, S.W.1.

J.B.A. Eng. Co. have capacity available for making 2.5 c.c., 15 c.c. 2-stroke Model Aero Engines, standard models or your own drawings, prototypes, model parts, etc. Trade enquiries invited.—54, Broadway Court, Wimbledon. Wim. 2980.

Finished and Unfinished "Purley Grange" parts, several volumes MODEL ENGINEER, micrometer, combination set, V blocks, dividers, 2 drill chucks, Stanley plane, vice, tenon saw, files, hack-saw blades drill brace, drills No. 70 to 1 inch, reamers, including expansion, ½" to 1⅛", emery wheels, tipped lathe tools, plug gauges, 2 metal tool boxe taps and dies, 6-B.A. to ¾", milling cutters, slitting saws, silver solder, silver steel, £50 the lot. S.A.E. detailed list.—Box No. 4210, MODEL ENGINEER Offices.

Handsome Present. Model Screw Steamer "Britannia," Cunard colours, nearly 9 feet by approx. 1 foot beam. Engineer built, powerful engine, pump, two funnels, copper boiler and superheater, approx. ¾ cwt., solid copper stem, covered deck, interior lined aluminium. Requires assembling and some piping. Tow Canoe, £50, or nearest offer.—FEILDEN, 38, Walmer Road, Birkdale, Lancashire.

"Hielan' Lassie" Frames cut to shape, ⅛" plate, price 25s. per set. Formers in ¼" steel plate for boiler 30s., set of 5 tube plates drilled. Orders by post only, taken in strict rotation. Cash with order, from—THE GLENMOOR ENG. Co. LTD., Eyres Avenue, Stanningley Road, Leeds 12.

Wanted, Gauge "1" Rolling St[illegible], also Coach Bodies.—WYMAN, 9, K[illegible]ton Road, Leicester.

Experienced Tinsmith required to make experimental and prototype models, mainly in light gauge tinplate and aluminium. State experience and age.—Box No. 4214, MODEL ENGINEER Offices.

L.M.S. 0-6-0 Bassett-Lowke Electric Engine and Tender, 6/10 volts D.C., as new. First cheque for £5 secures.—MARTIN, 53, Mornington Road, Woodford Green, Essex.

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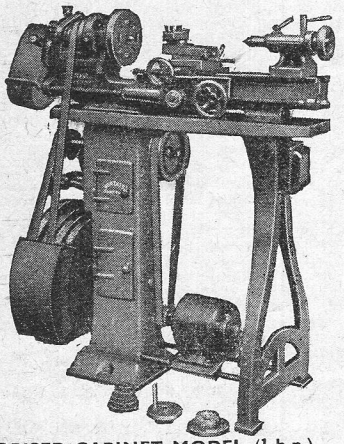

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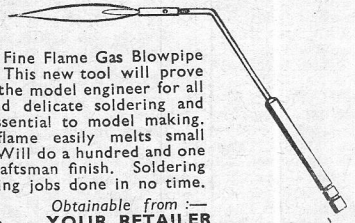

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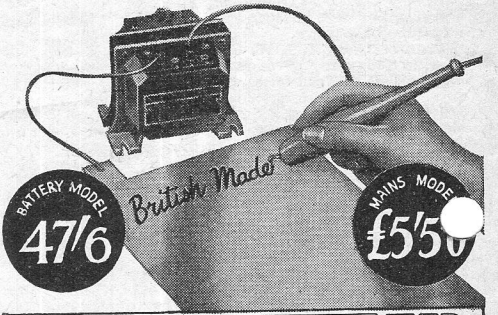

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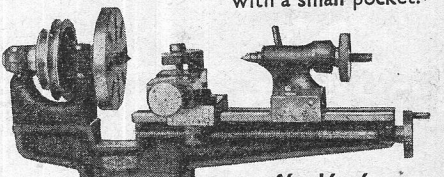

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